Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FREEDOM OF INFORMATION ACT/PRIVACY PROGRAM

April 26, 2021

In reply refer to: FOIA #BPA-2020-00784-F

Andrew Missel
Advocates for the West
3701 SE Milwaukie Avenue, Suite B
Portland OR 97202
Email: amissel@advocateswest.org

Dear Mr. Missel,

This communication concerns your agency records request submitted to the Bonneville Power Administration (BPA), made via the Freedom of Information Act, 5 U.S.C. § 552 (FOIA).Your request was received on May 15, 2020, and formally acknowledged on May 28, 2020.

Request
"1. Any communications between BPA and its customers (or any organization comprised of its customers) from January 1, 2019 through the search date concerning BPA's ability to satisfy its "preference and surplus" statutory requirements while participating in the EIM.

2. Any internal BPA records created or modified from January 1, 2019 through the search date concerning BPA's ability to satisfy its "preference and surplus" statutory requirements while participating in the EIM. This includes any records underlying BPA's determination in the 2019 ROD that it will likely be able to satisfy the notice requirements of 16 U.S.C. § 837a while participating in the EIM. See ROD at 62–63."

Response
The agency searched for and collected 720 pages of responsive records from knowledgeable agency personnel in the Office of General Counsel, Business Transformation Office, and Power Rates office. Of those 720 pages, 402 pages accompany this communication, released in full and without redactions. Of those 720 pages, 318 pages accompany this communication with redactions applied under 5 U.S.C. § 552(b)(5) (Exemption 5). A more detailed explanation of the applied exemptions follows.

Explanation of Exemptions
The FOIA generally requires the release of all agency records upon request. However, the FOIA permits or requires withholding certain limited information that falls under one or more of nine statutory exemptions (5 U.S.C. §§ 552(b)(1-9)). Further, section (b) of the FOIA, which contains

the FOIA's nine statutory exemptions, also directs agencies to publicly release any reasonably segregable, non-exempt information that is contained in those records.

Exemption 5

Exemption 5 protects "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency" (5 U.S.C. § 552(b)(5)). In plain language, the exemption protects privileged records.

Deliberative Process Privilege

The FOIA's Exemption 5 deliberative process privilege protects records showing the deliberative or decision-making processes of government agencies. Records protected under this privilege must be both pre-decisional and deliberative. A record is pre-decisional if it is generated before the adoption of an agency policy. A record is deliberative if it reflects the give-and-take of the consultative process, either by assessing the merits of a particular viewpoint, or by articulating the process used by the agency to formulate a decision. Here, BPA relies on Exemption 5 to protect deliberative and pre-decisional communications appertaining to the agency's interests in participating in the EIM. BPA has considered and declined a discretionary release of some pre-decisional and deliberative information in the responsive records set because disclosure of that information would harm the interests and protections encouraged by Exemption 5.

Attorney-Client Privilege

The Exemption 5 attorney-client privilege protects confidential communications between an attorney and a client relating to a legal matter for which the client has sought professional advice. The privilege encompasses facts provided by the client and opinions provided by the attorney. In this case, BPA asserts Exemption 5 to protect confidential attorney-client communications appertaining to the agency's interests in participating in the EIM.

As required by 5 U.S.C. § 552(a)(8)(A), information has been withheld only in instances where (1) disclosure is prohibited by statute, or (2) BPA foresees that disclosure would harm an interest protected by the exemption cited for the record. When full disclosure of a record is not possible, the FOIA statute further requires that BPA take reasonable steps to segregate and release nonexempt information. The agency has determined that in certain instances partial disclosure is possible, and has accordingly segregated the records into exempt and non-exempt portions.

Fees

There are no fees associated with processing your FOIA request.

Certification

Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the records search, redaction decisions, and information release described above. Your FOIA request, BPA-2020-00784-F is now closed with the responsive agency information provided.

Appeal
The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to:

Director, Office of Hearings and Appeals
HG-1, L'Enfant Plaza
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-1615

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal by e-mail to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. (The Office of Hearings and Appeals prefers to receive appeals by email.) The appeal must contain all the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either (1) in the district where you reside, (2) where you have your principal place of business, (3) where DOE's records are situated, or (4) in the District of Columbia.

Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
E-mail: ogis@nara.gov
Phone: 202-741-5770
Toll-free: 1-877-684-6448
Fax: 202-741-5769

Questions about this communication may be directed to the FOIA Public Liaison Jason Taylor at jetaylor@bpa.gov or 503-230-3537. Questions may also be directed to Thanh Knudson, Flux Resources, LLP, at etknudson@bpa.gov or 503-230-5221. Thank you for your interest in the Bonneville Power Administration.

Sincerely,



Candice D. Palen, Freedom of Information/Privacy Act Officer

Responsive agency information accompanies this communication

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BPA-2020-00784-F 0001

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BPA-2020-00784-F 0001

Attachment A

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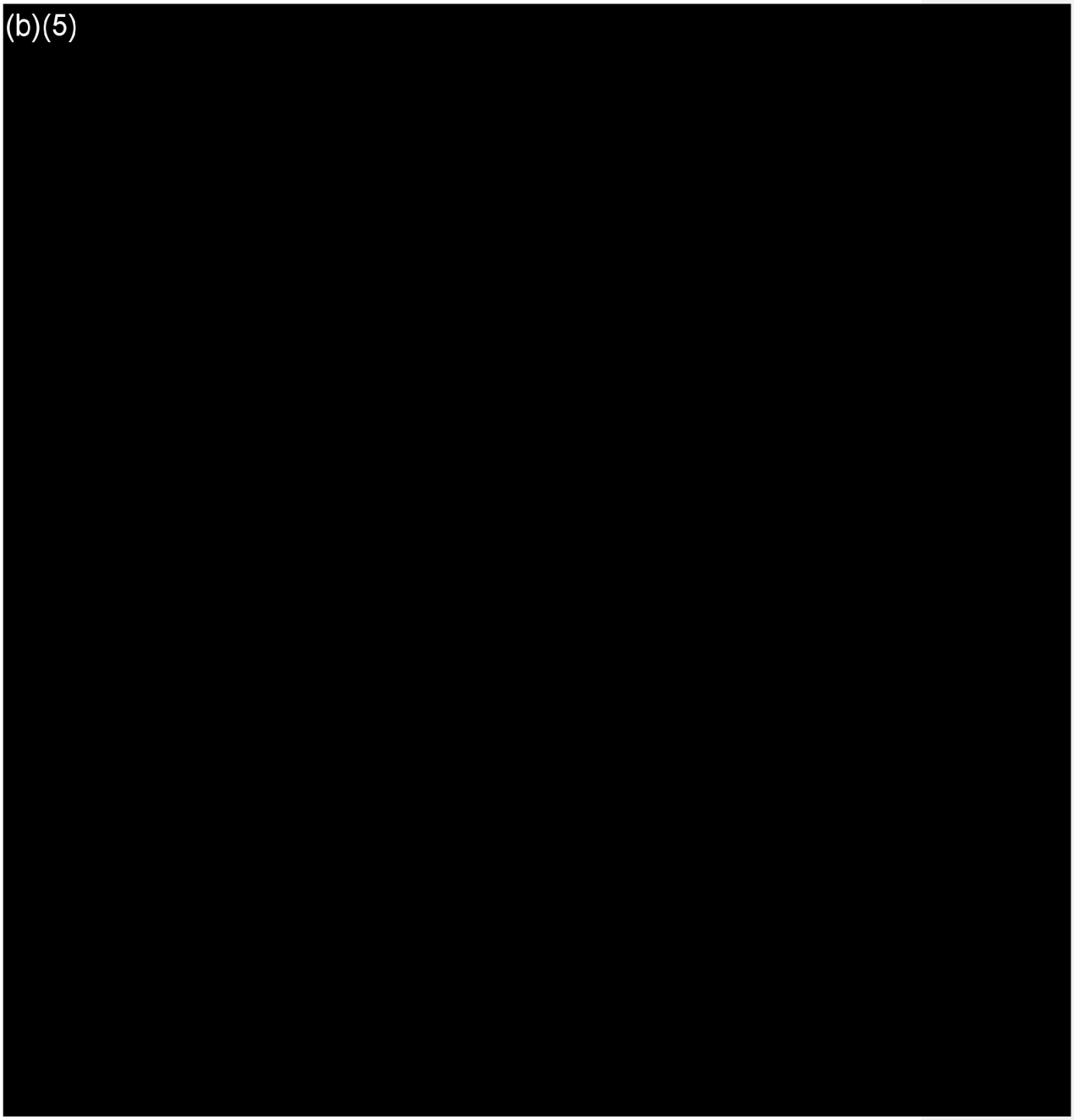

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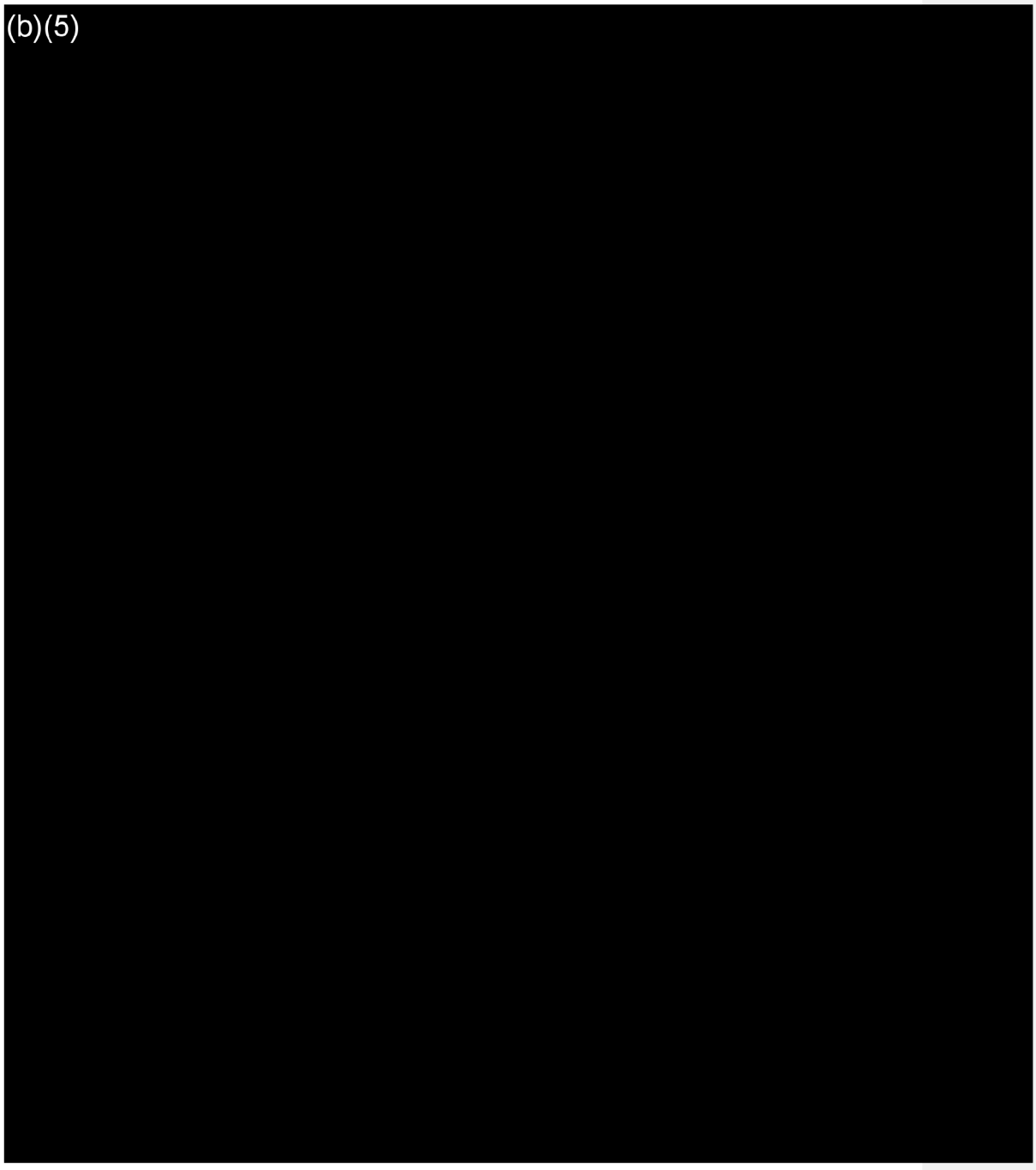

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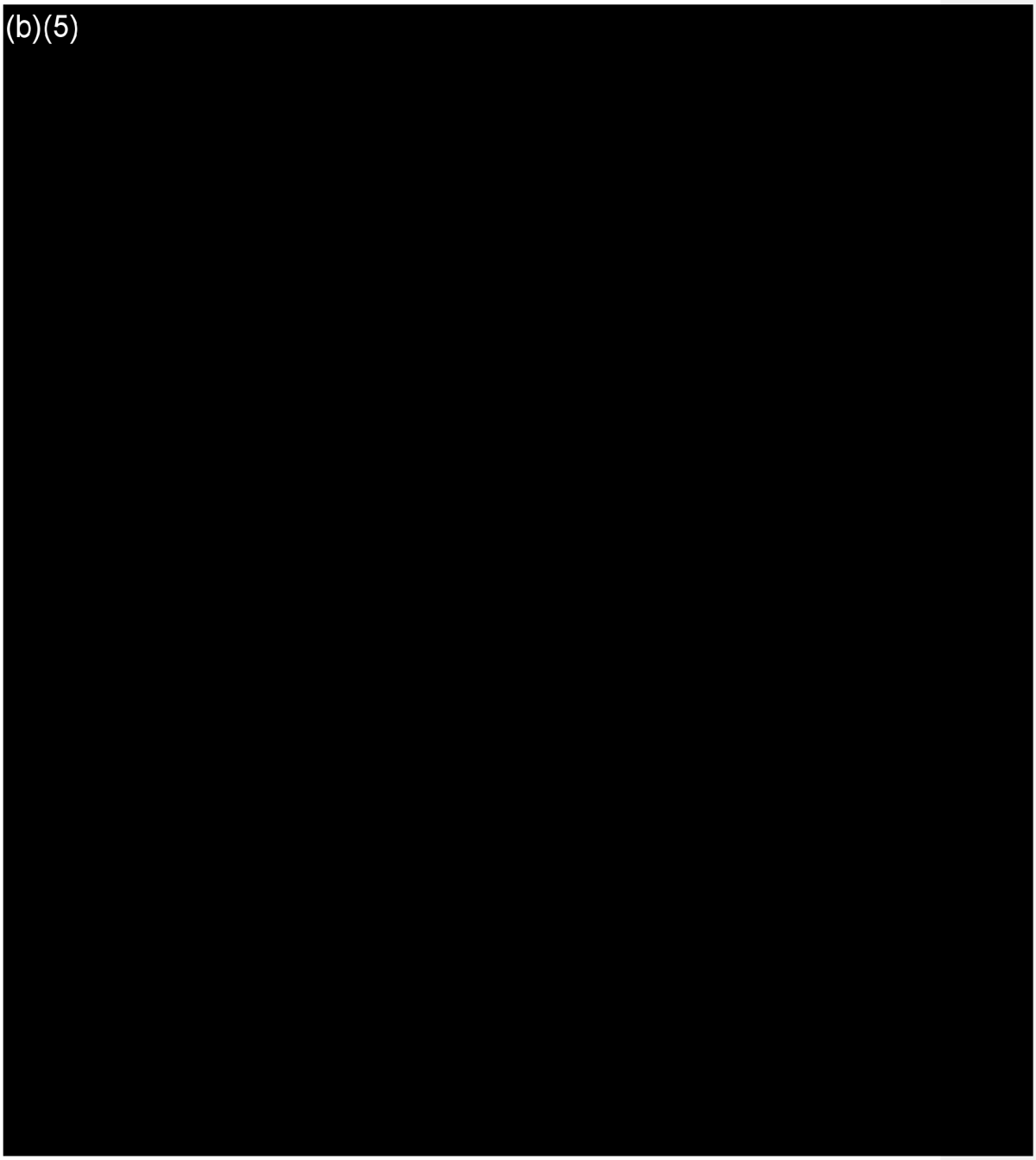

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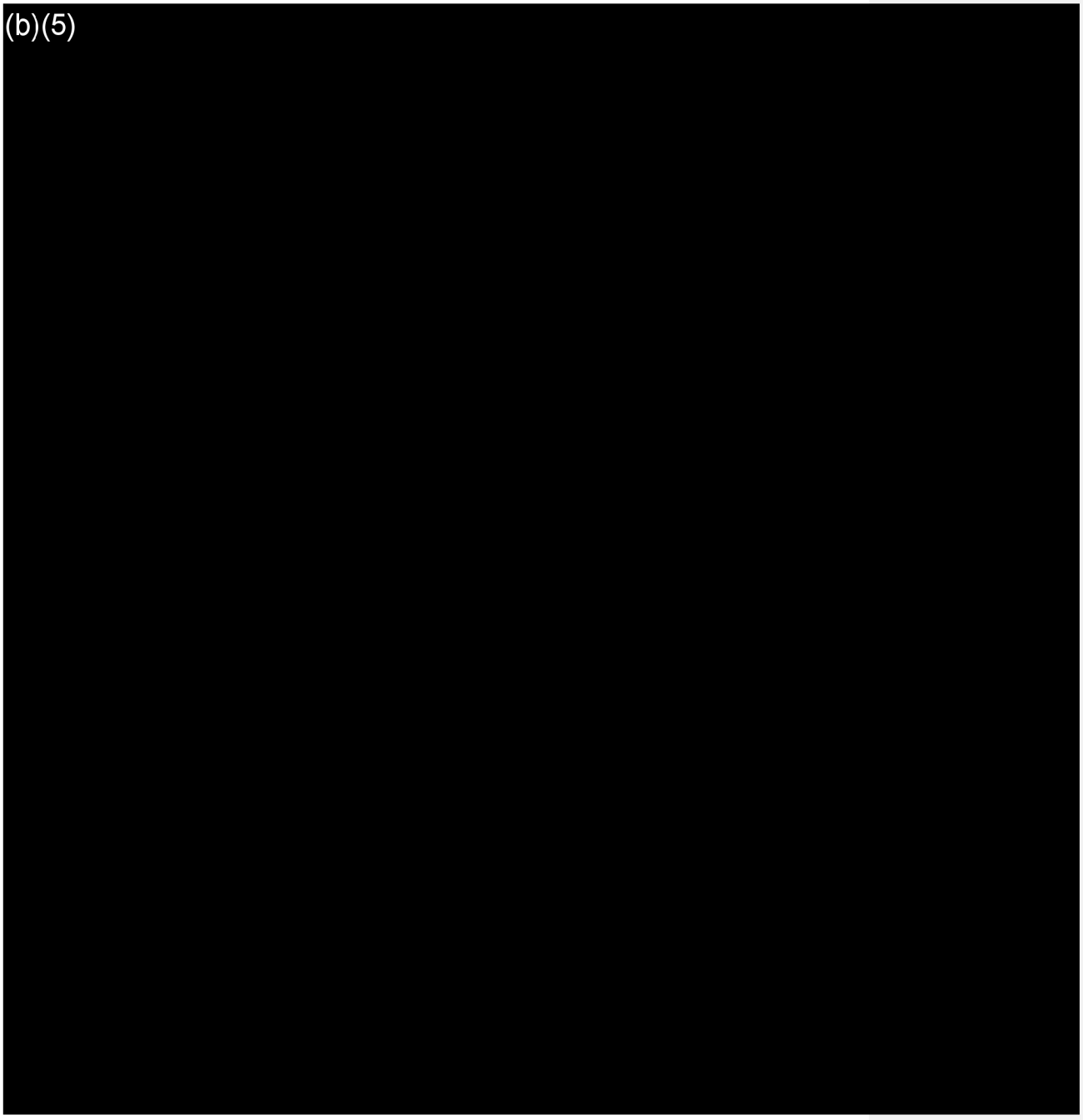

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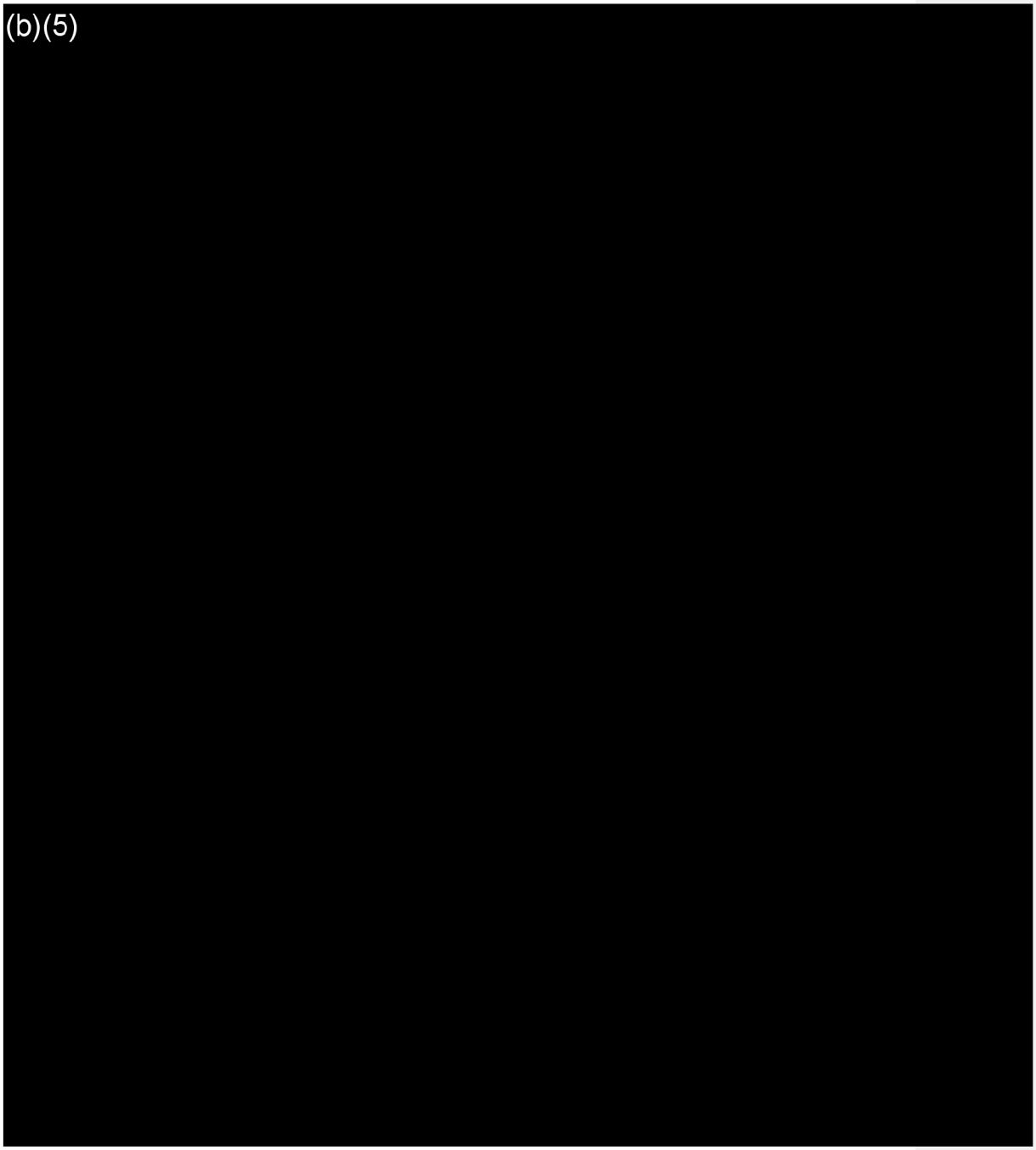

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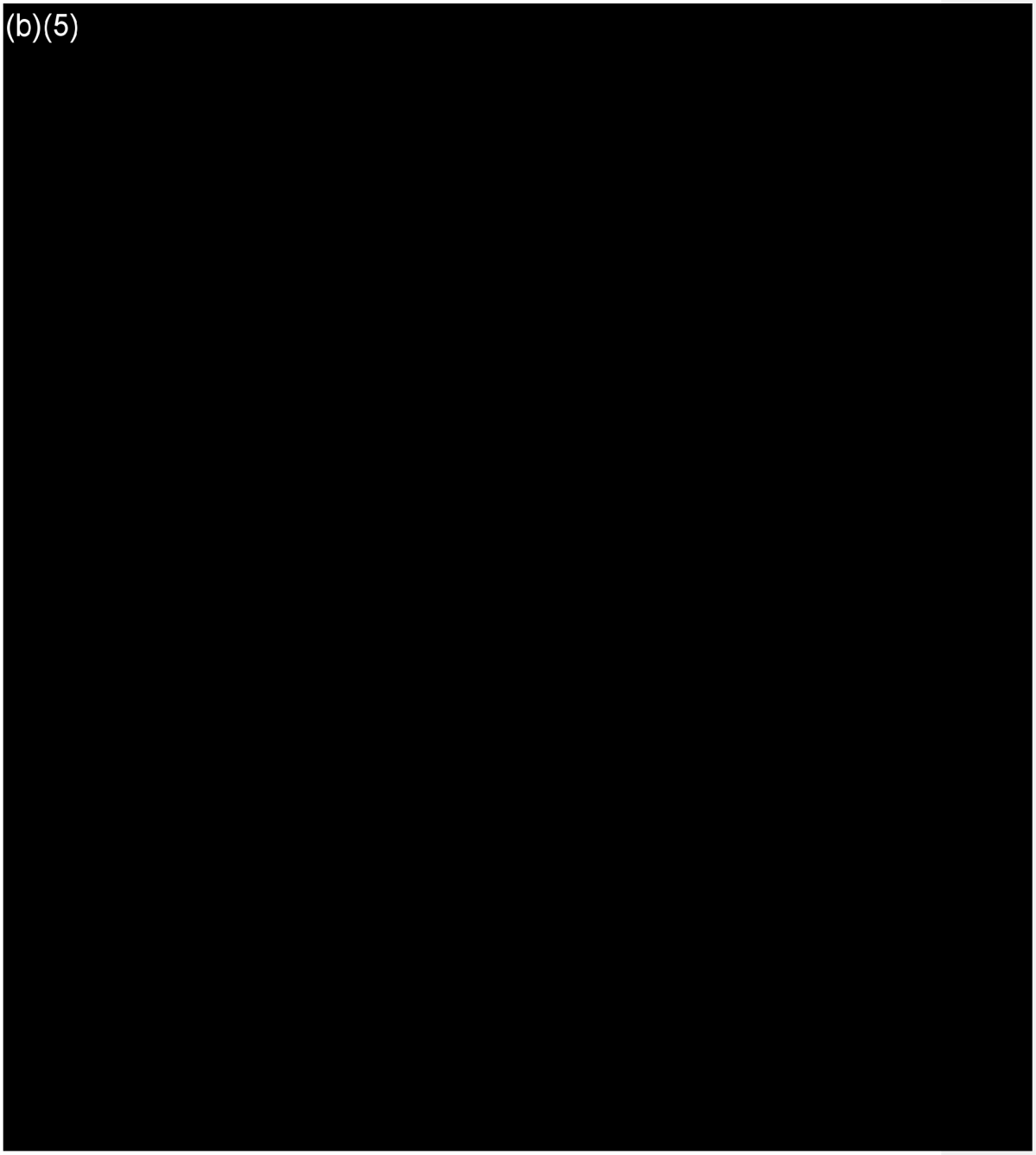

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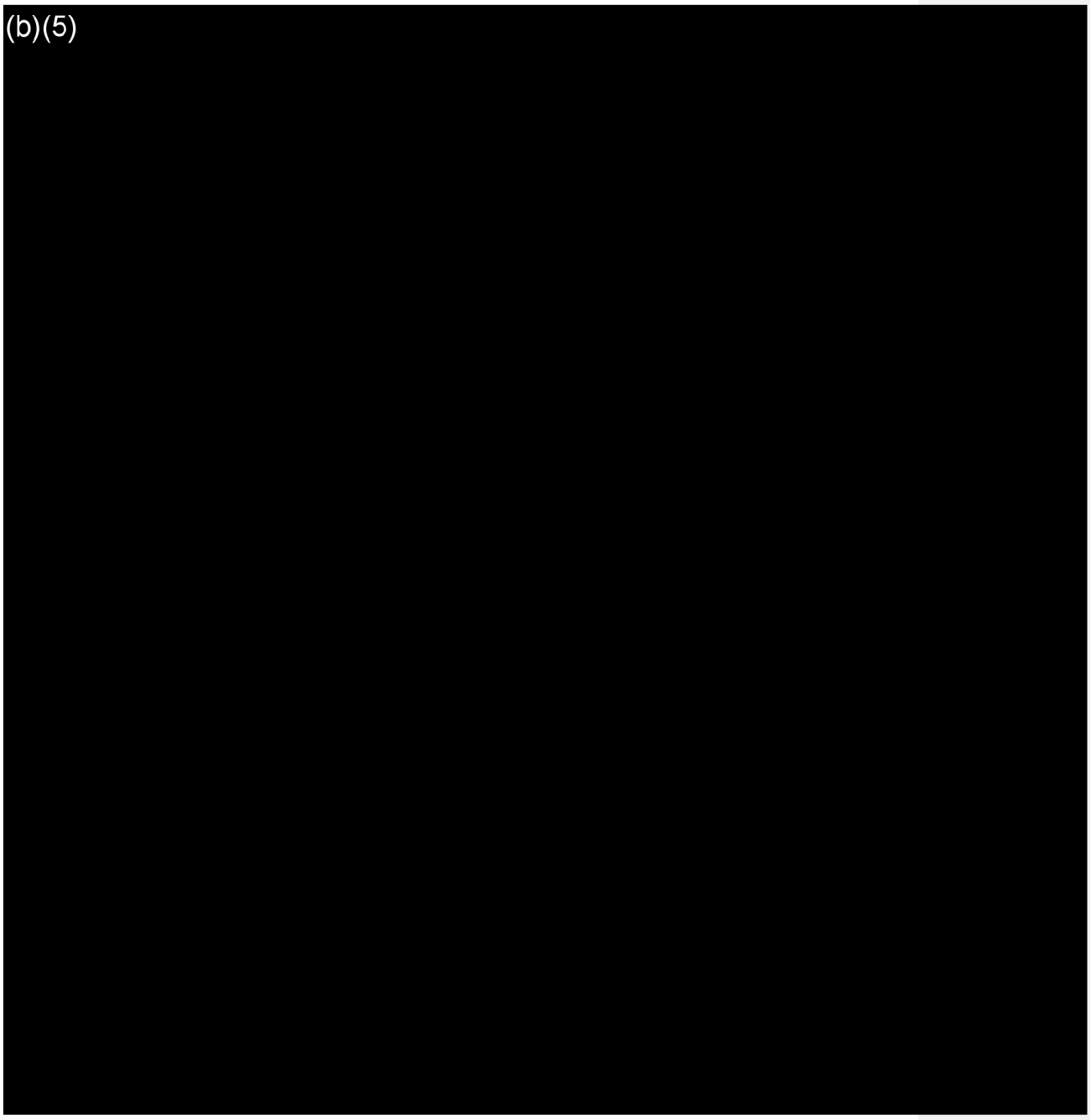

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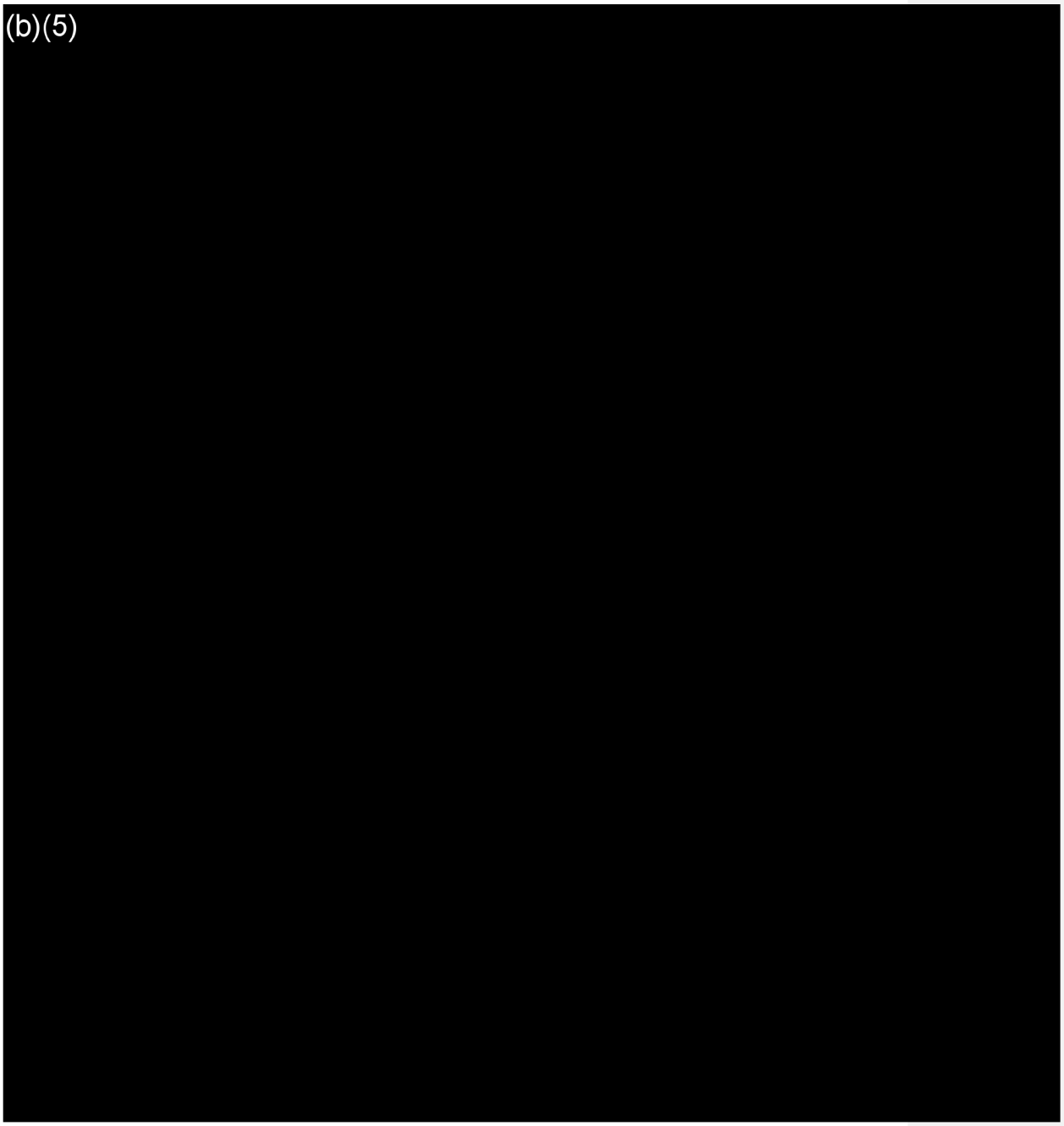

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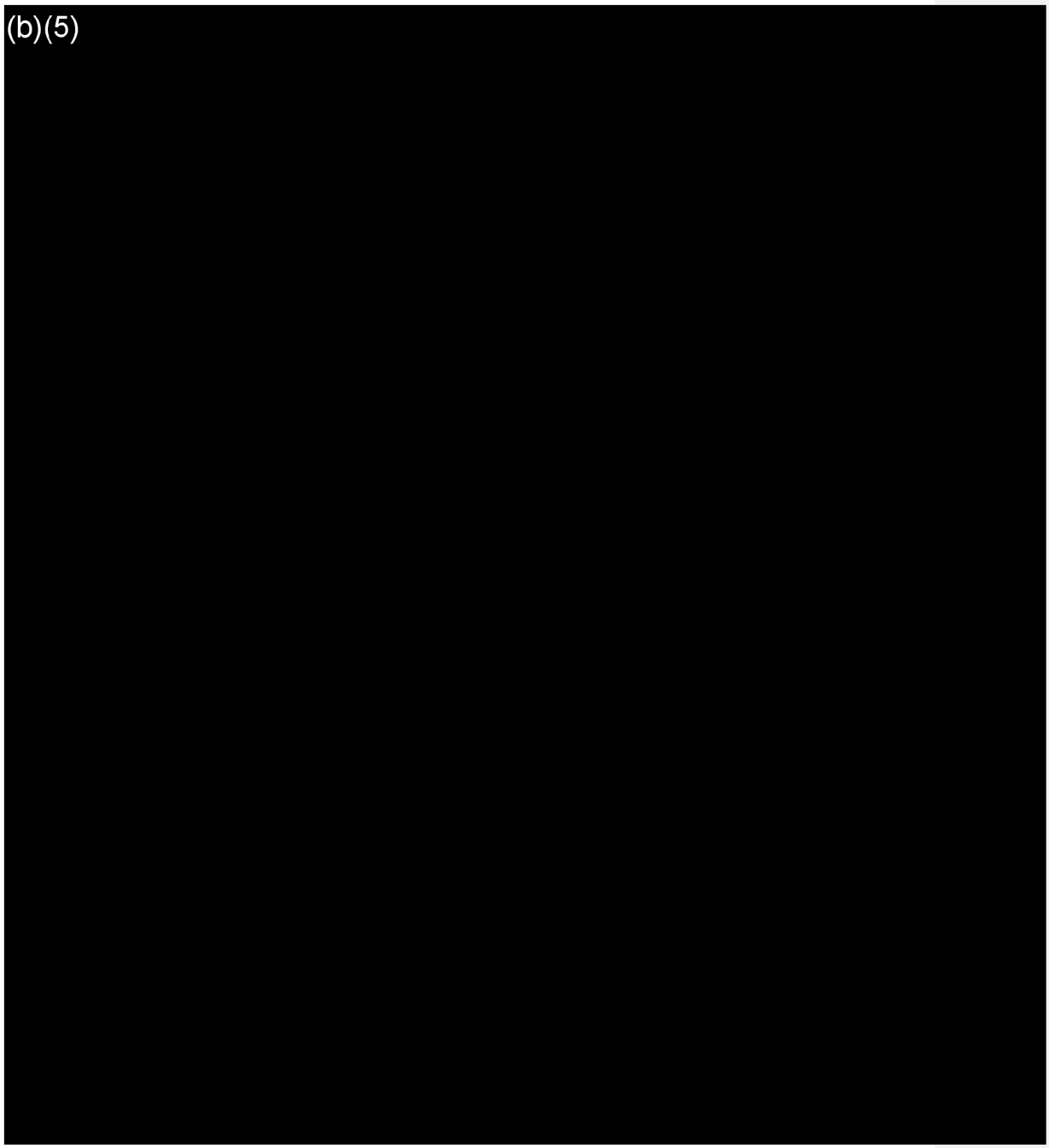

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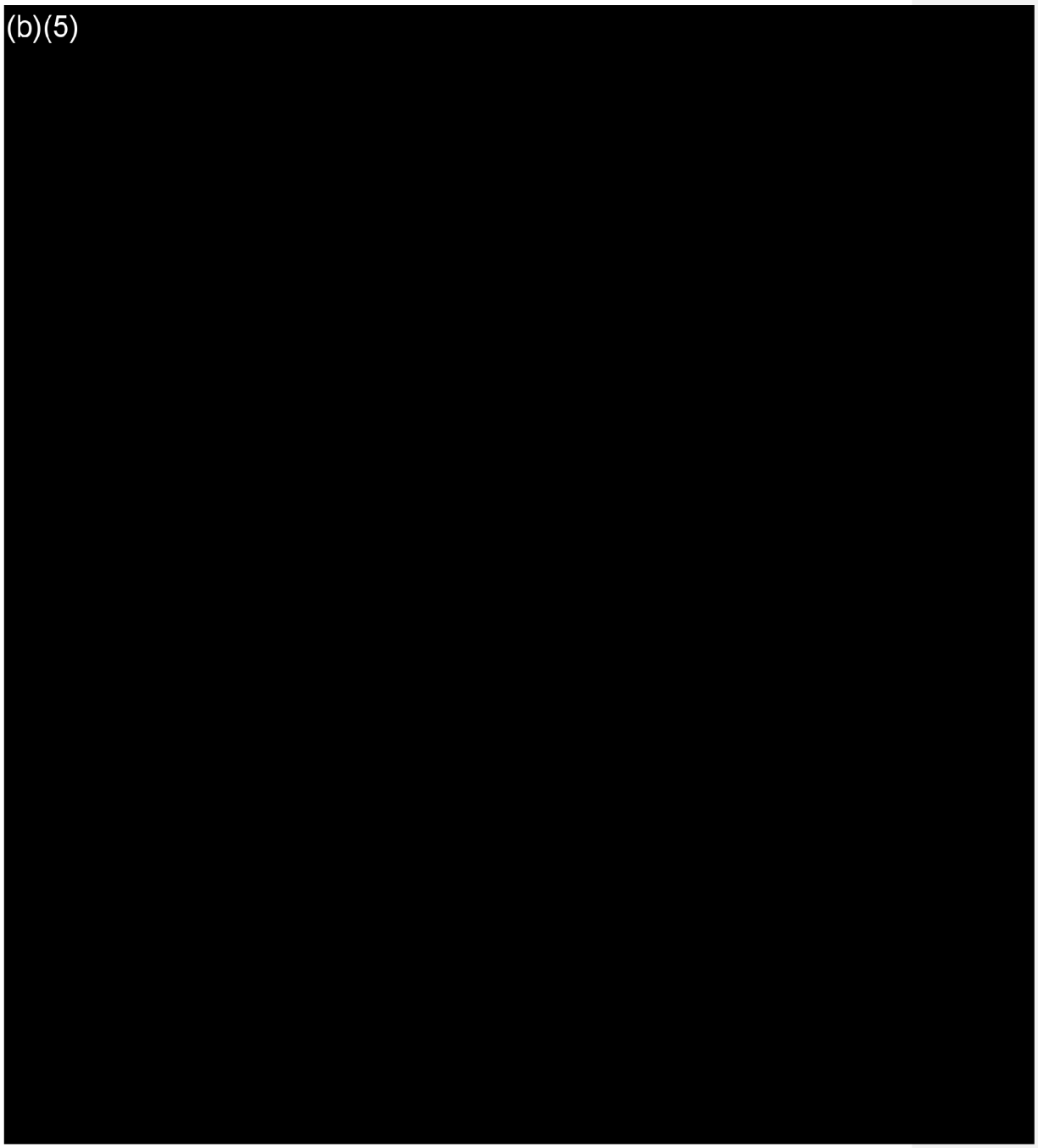

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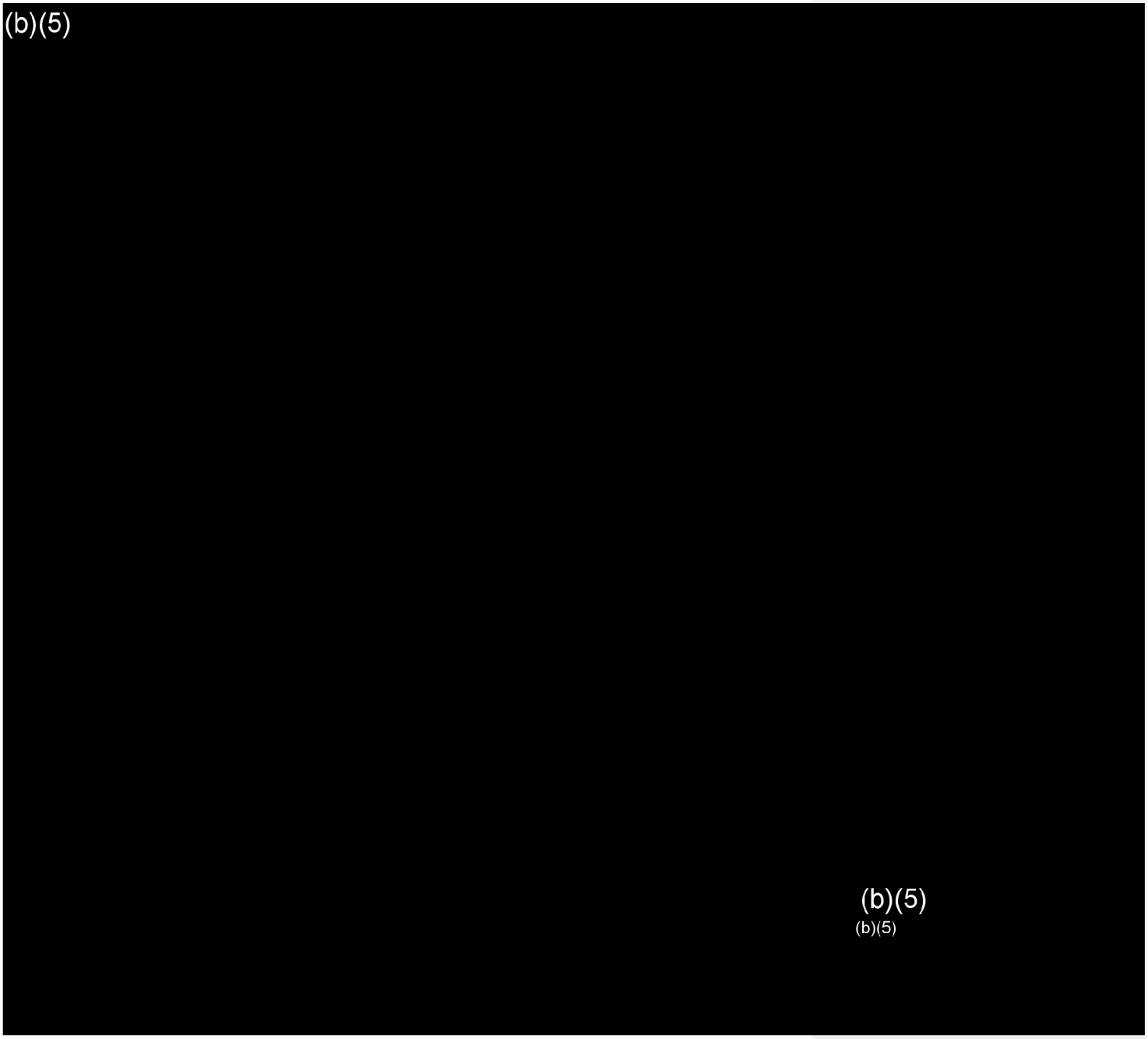

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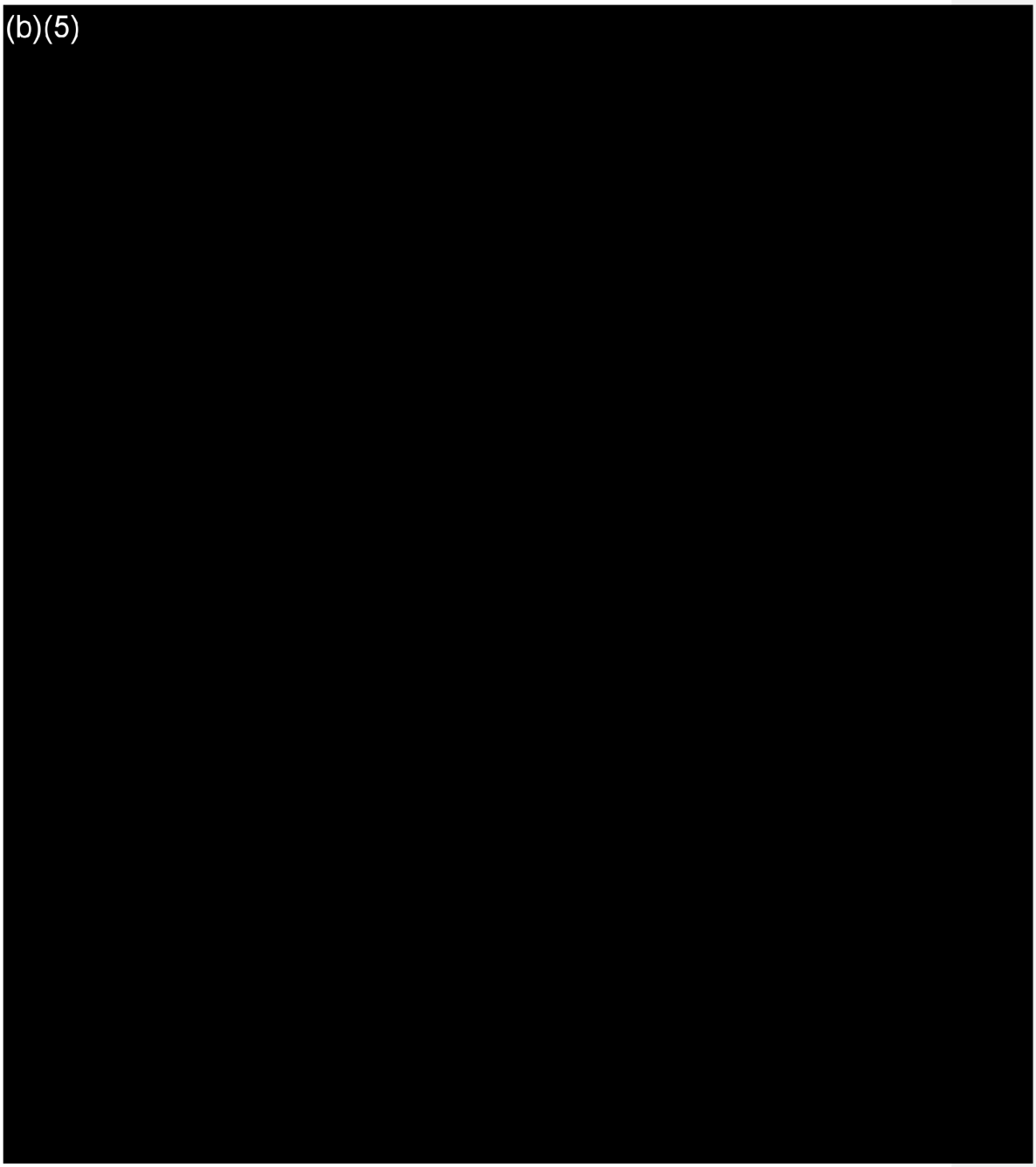

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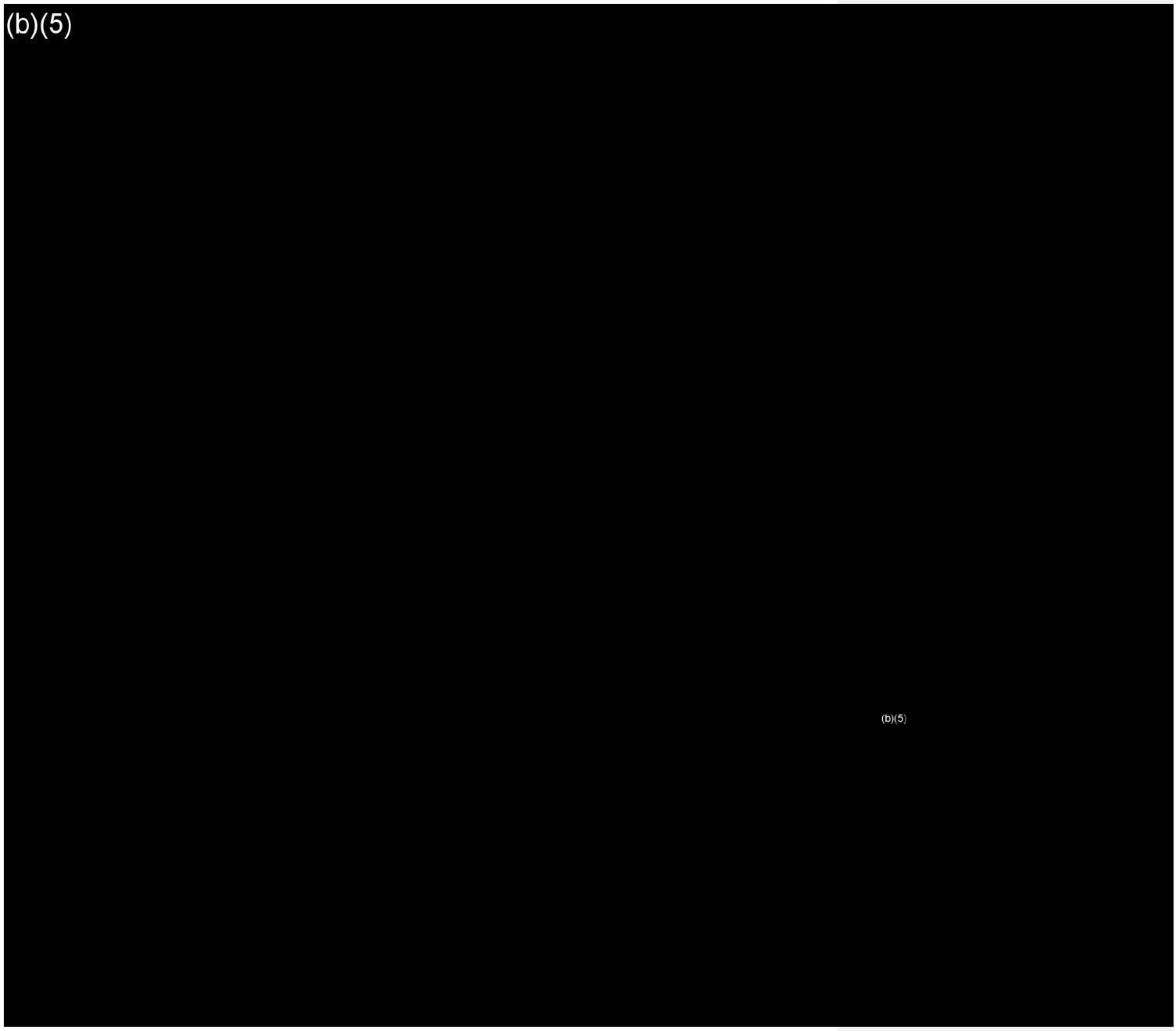

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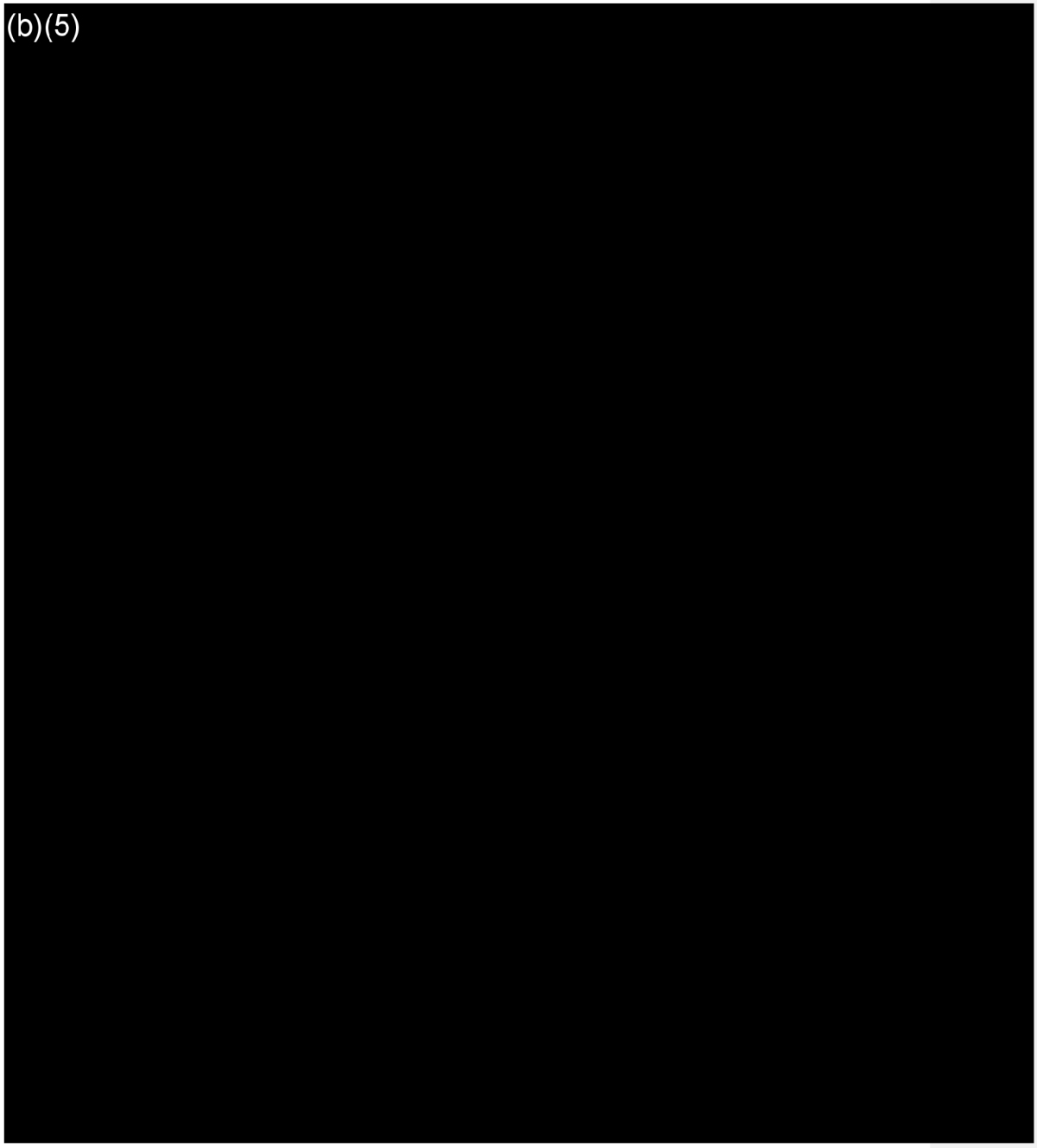

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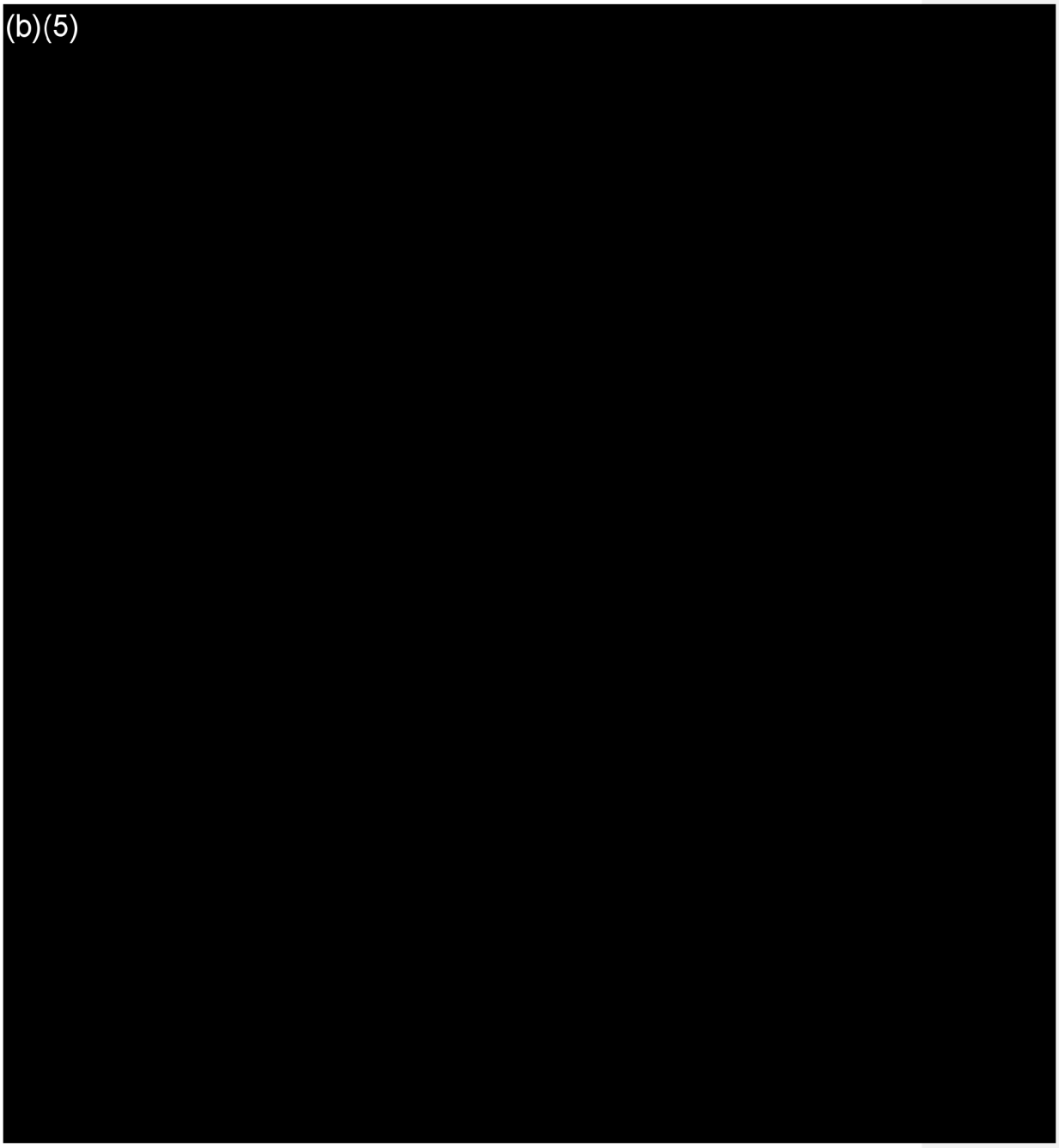

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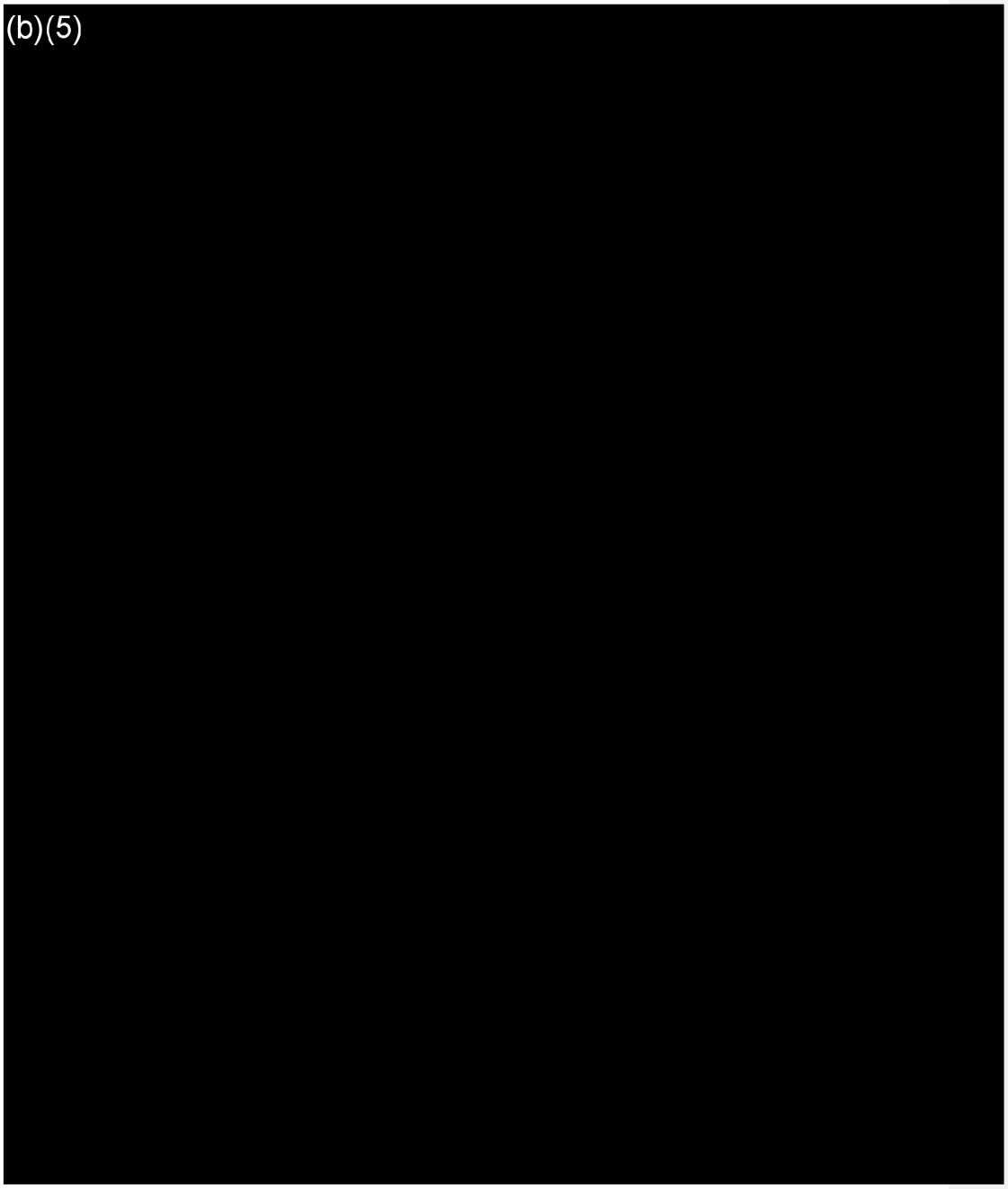

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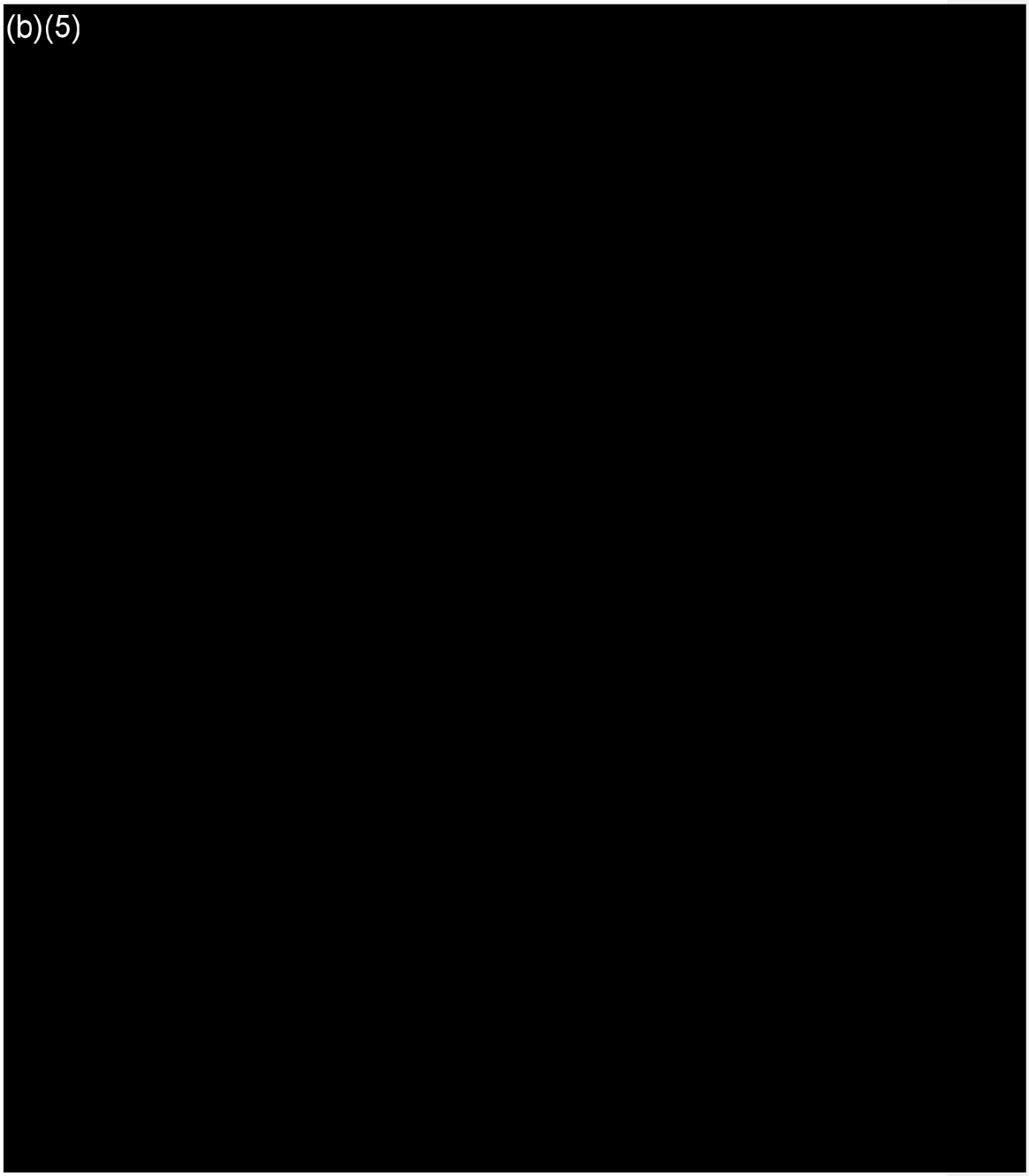

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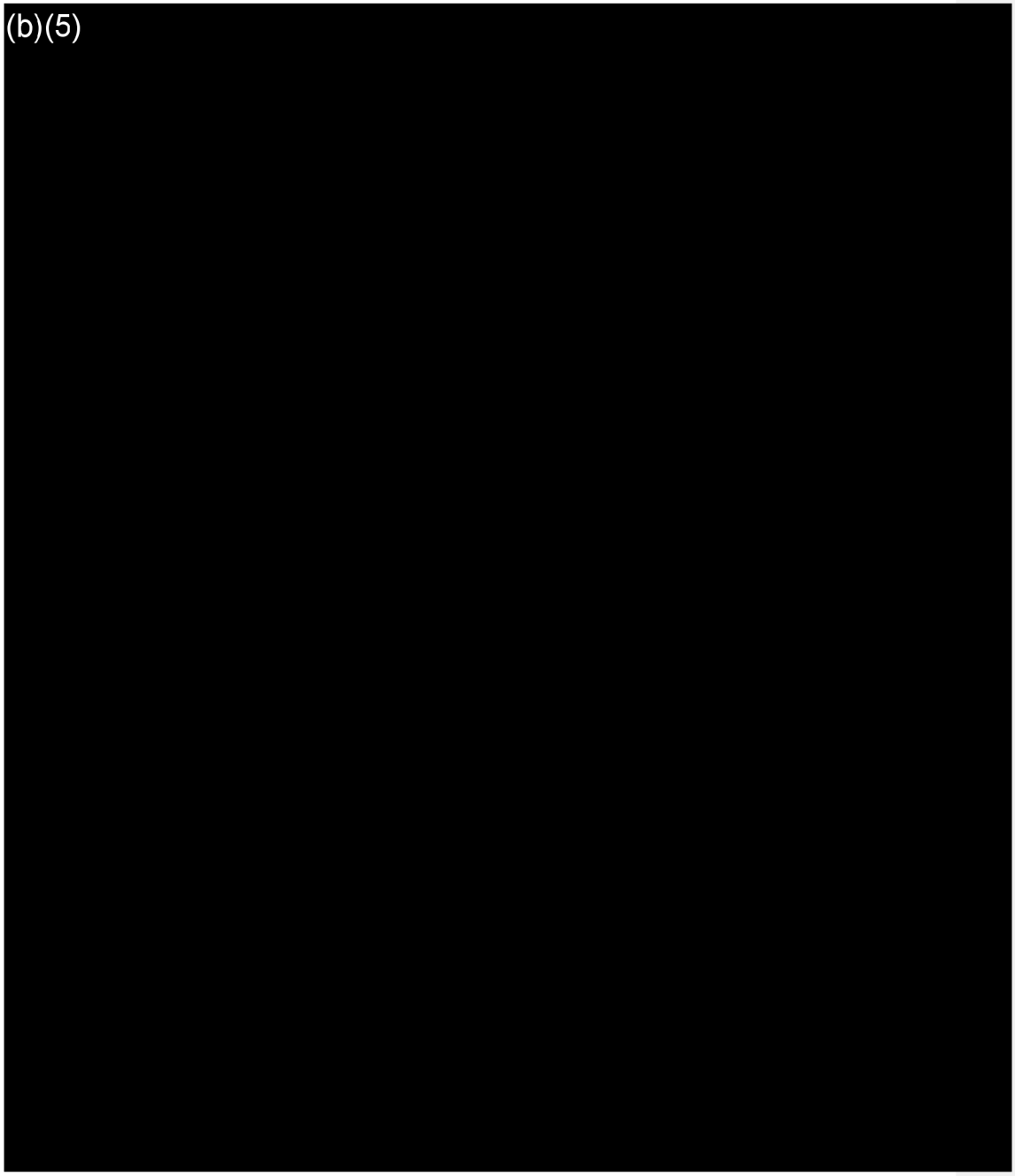

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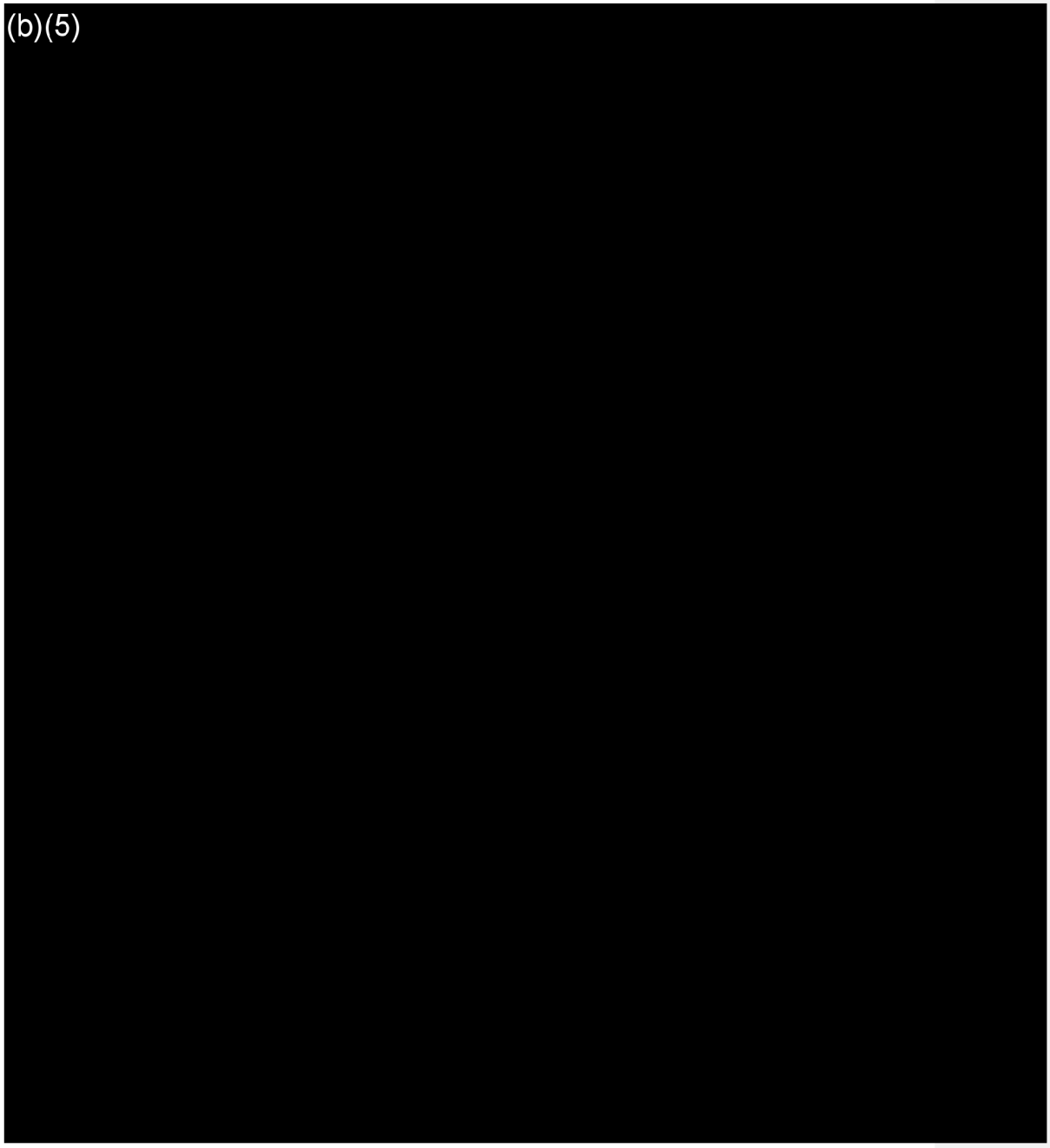

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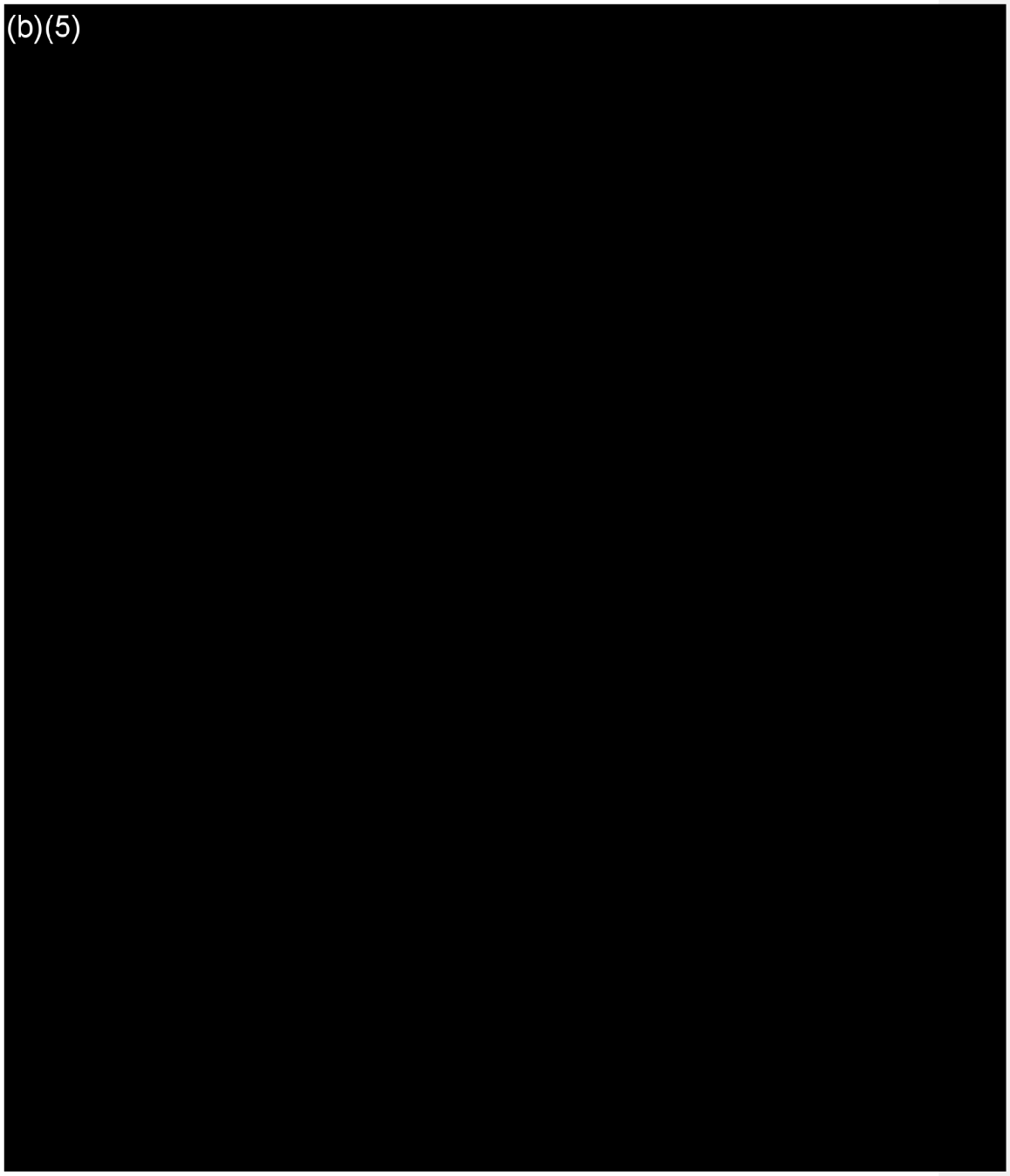

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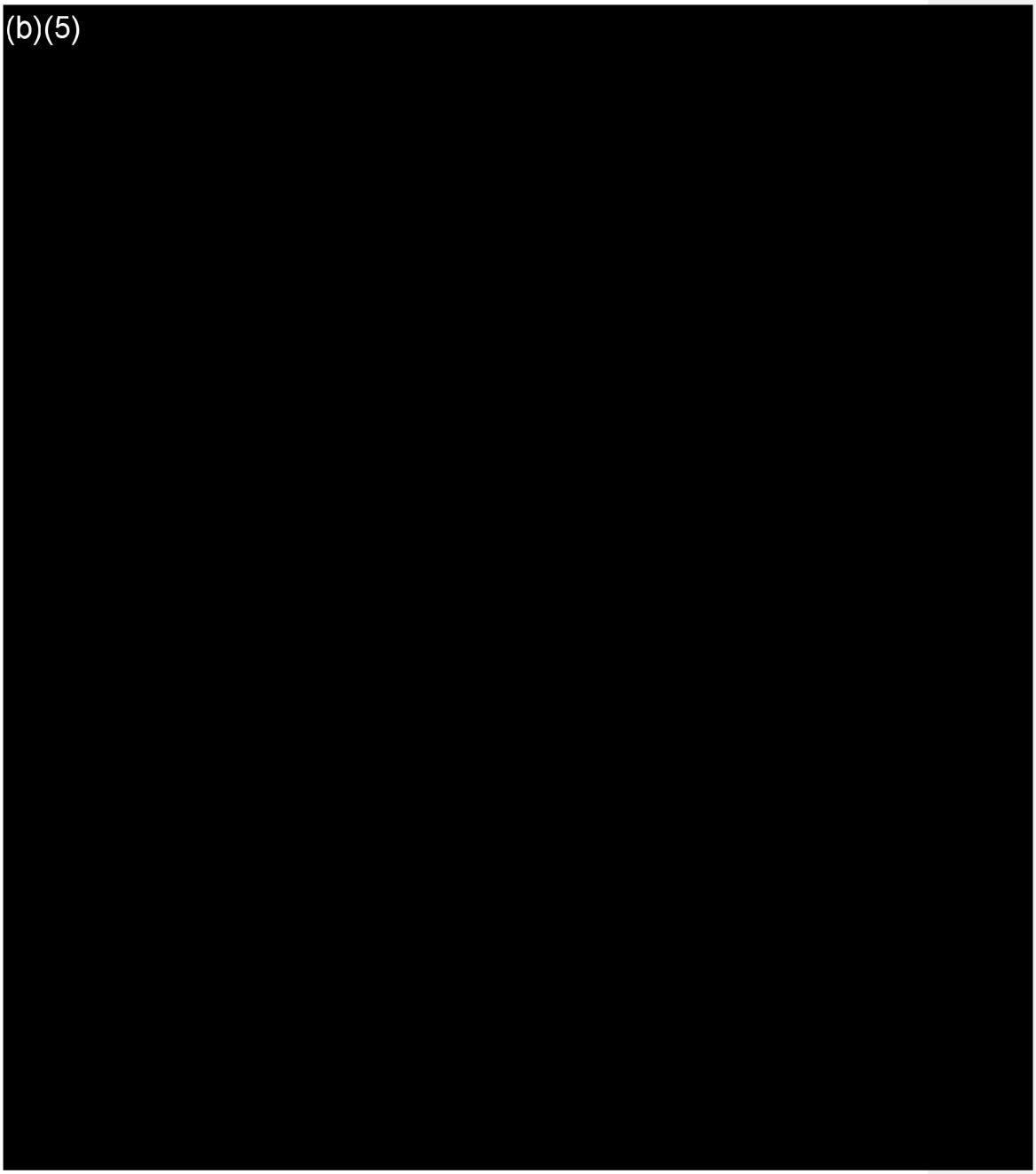

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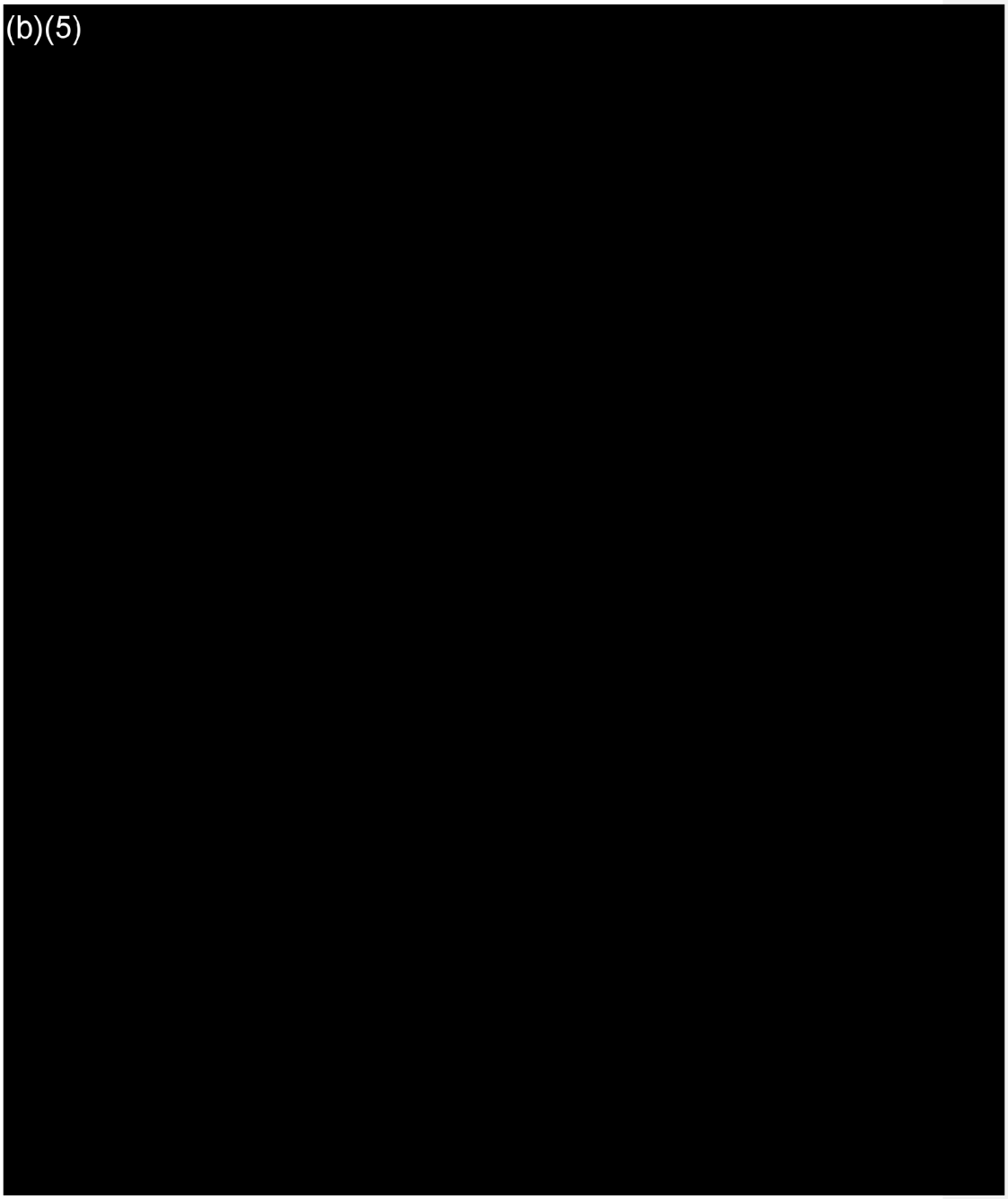

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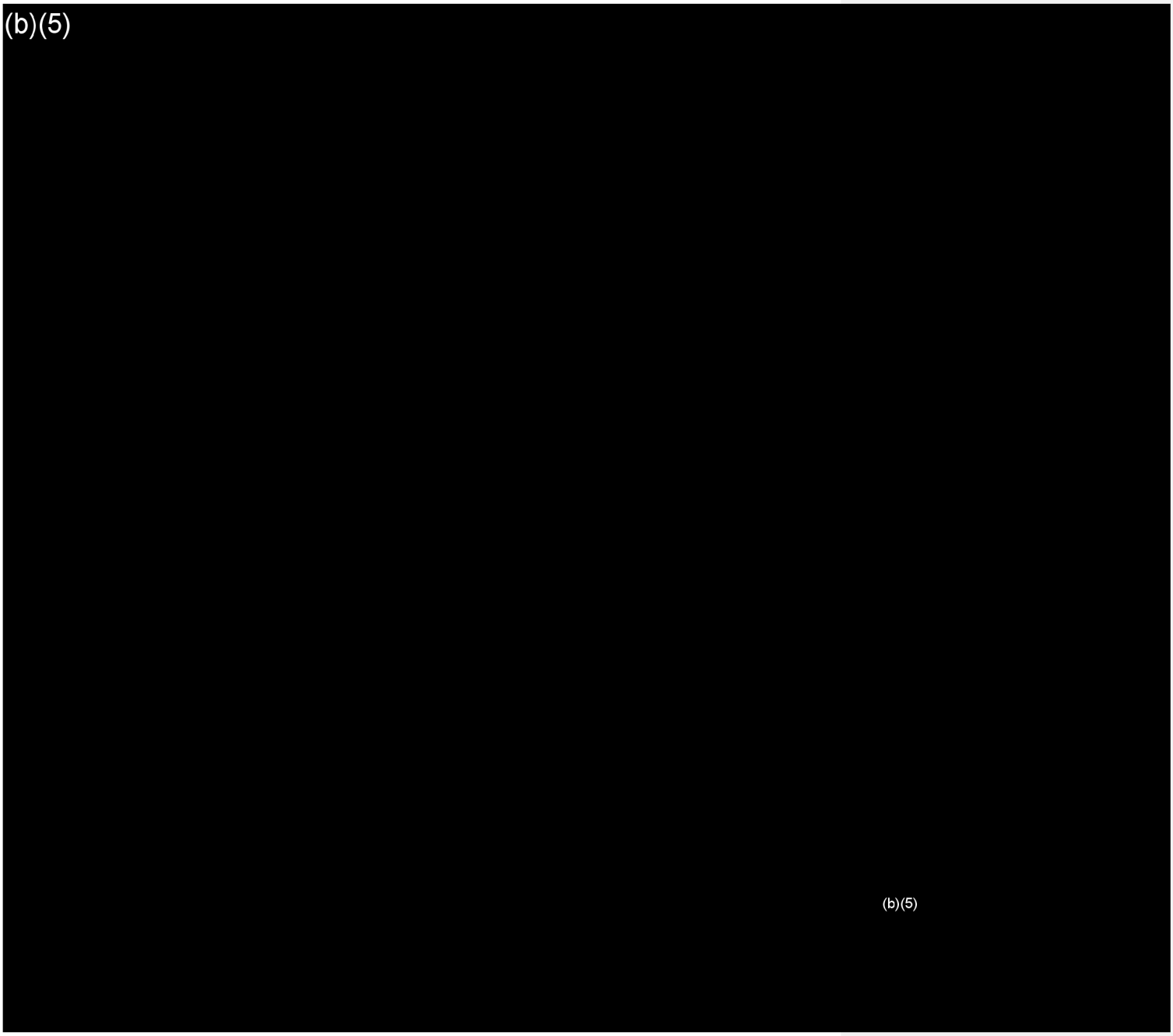

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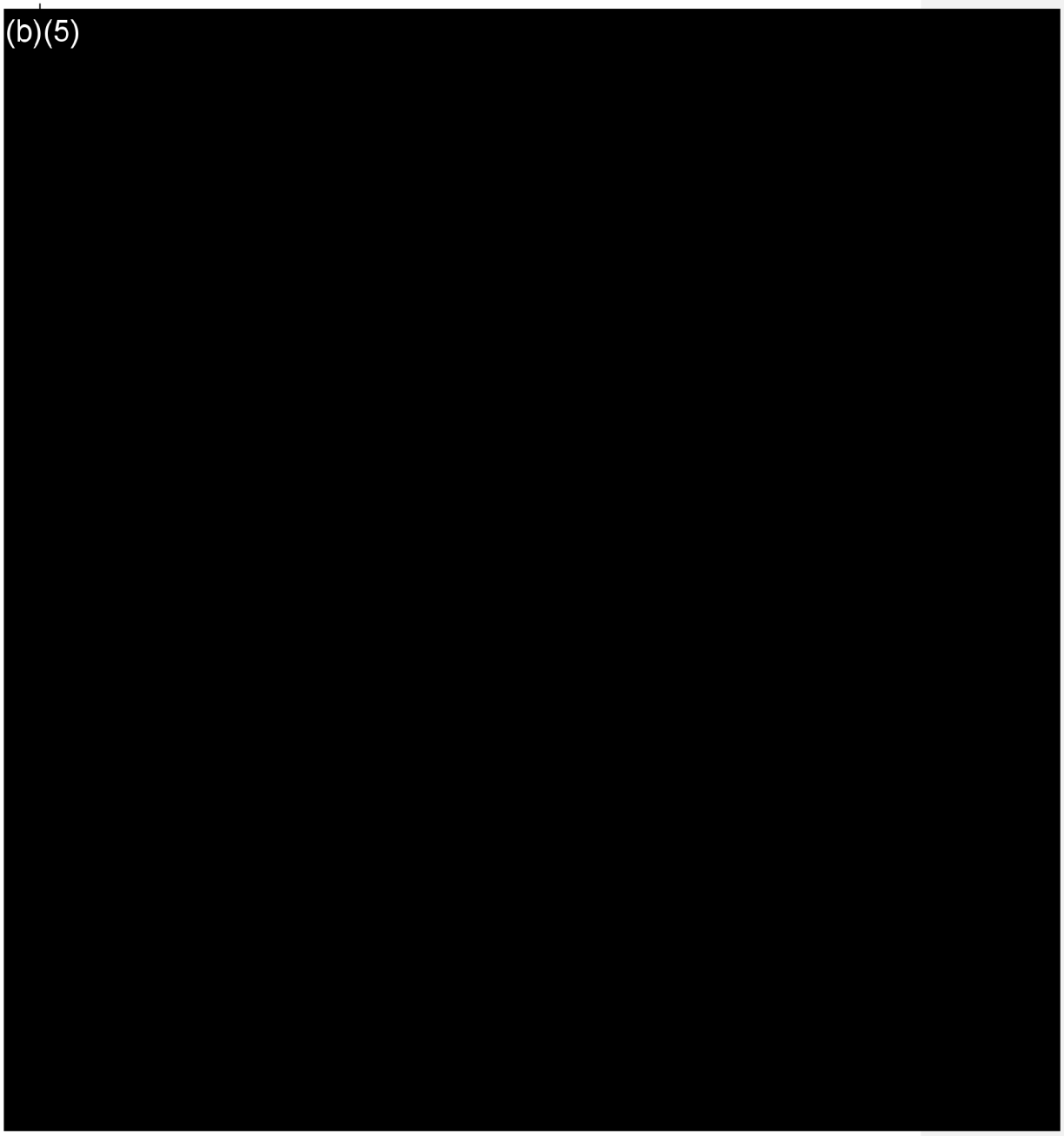

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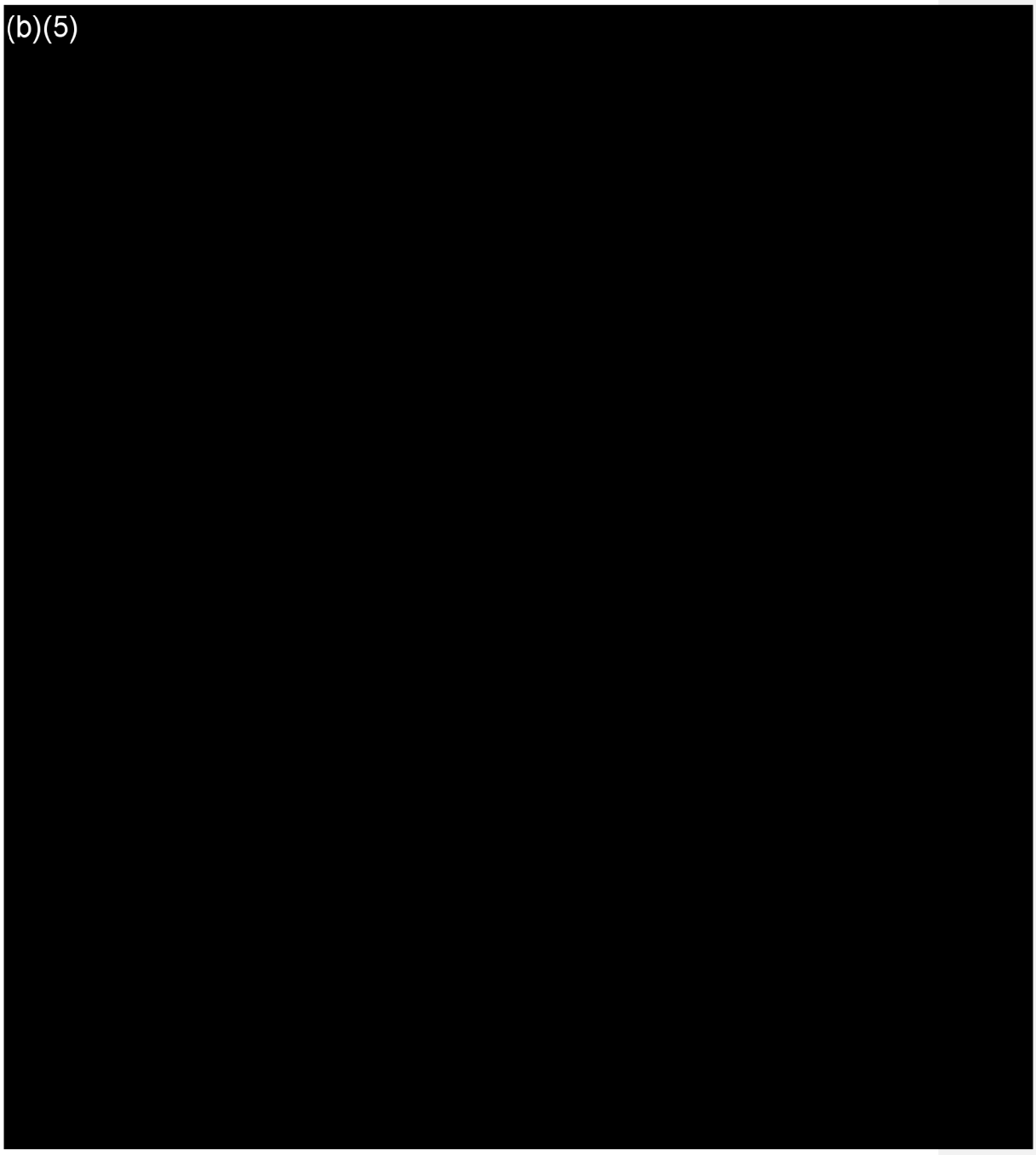

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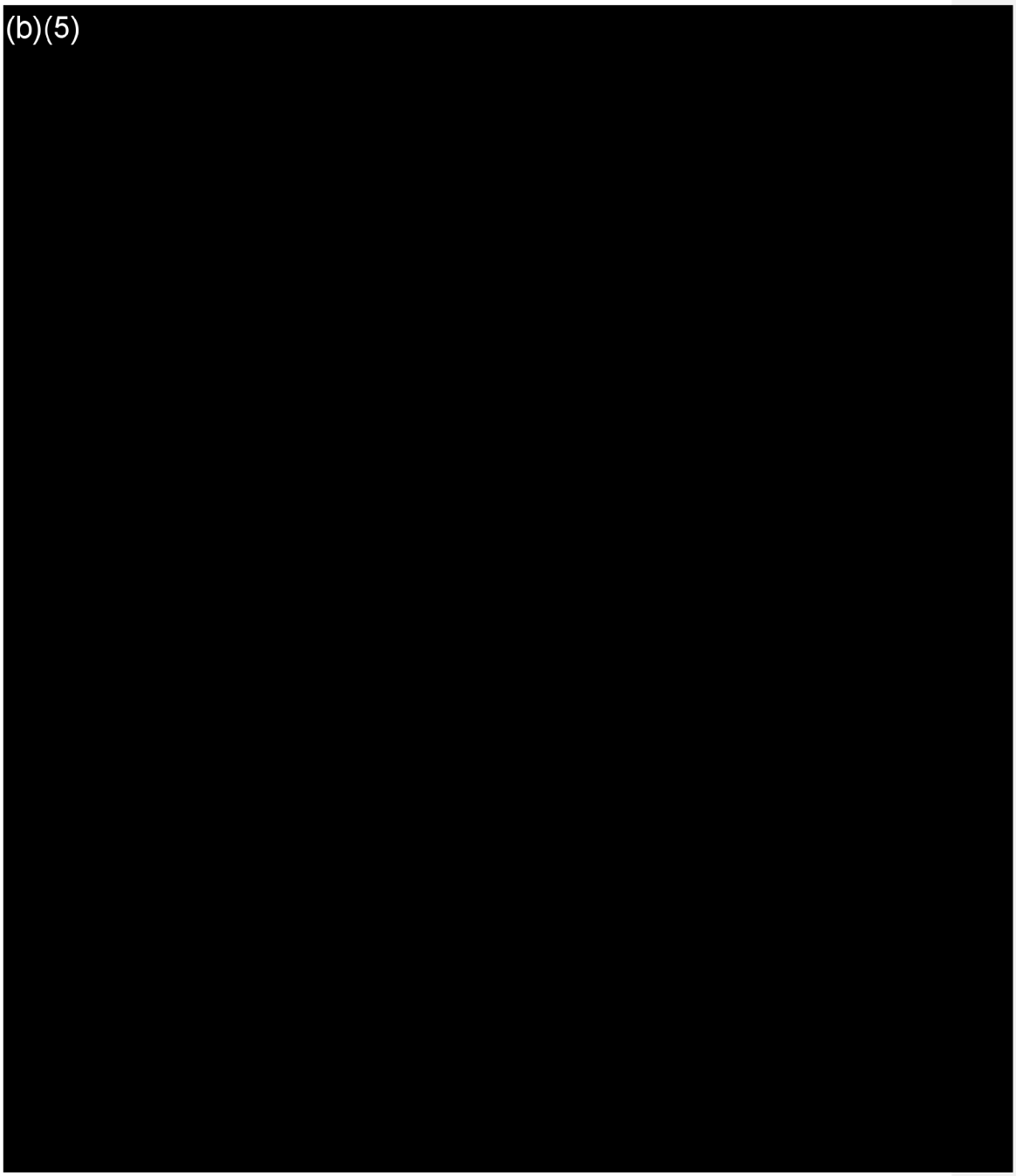
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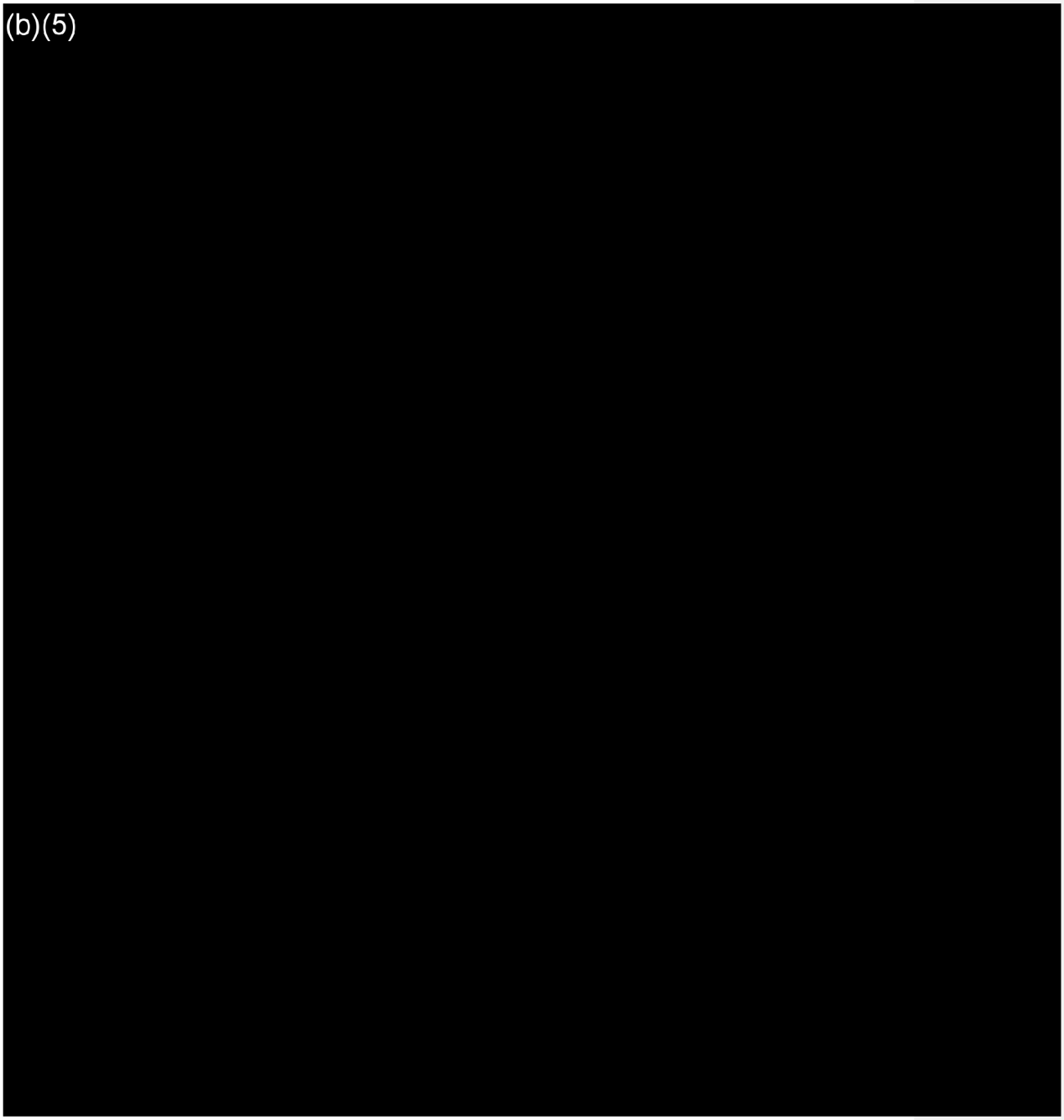

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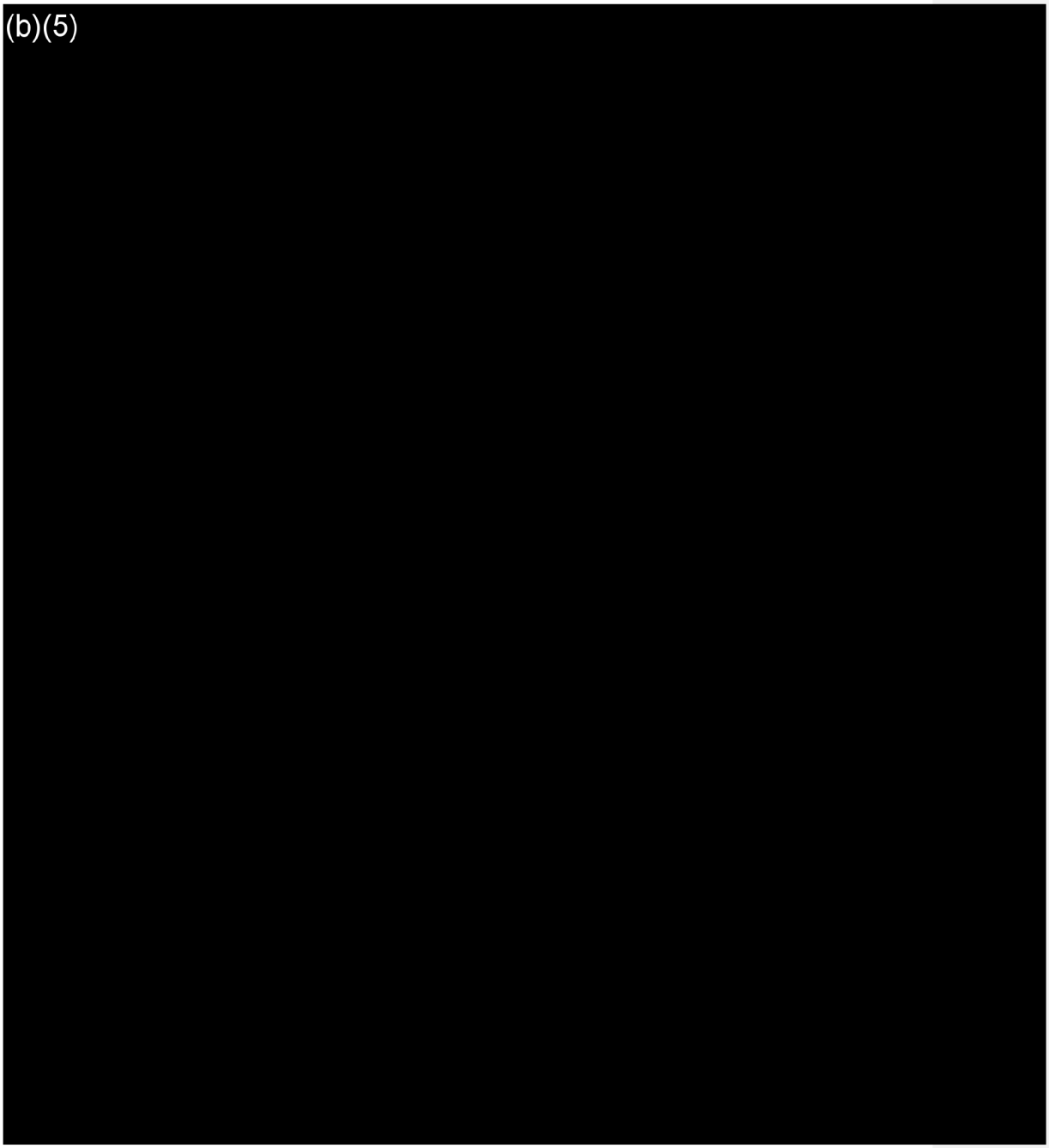

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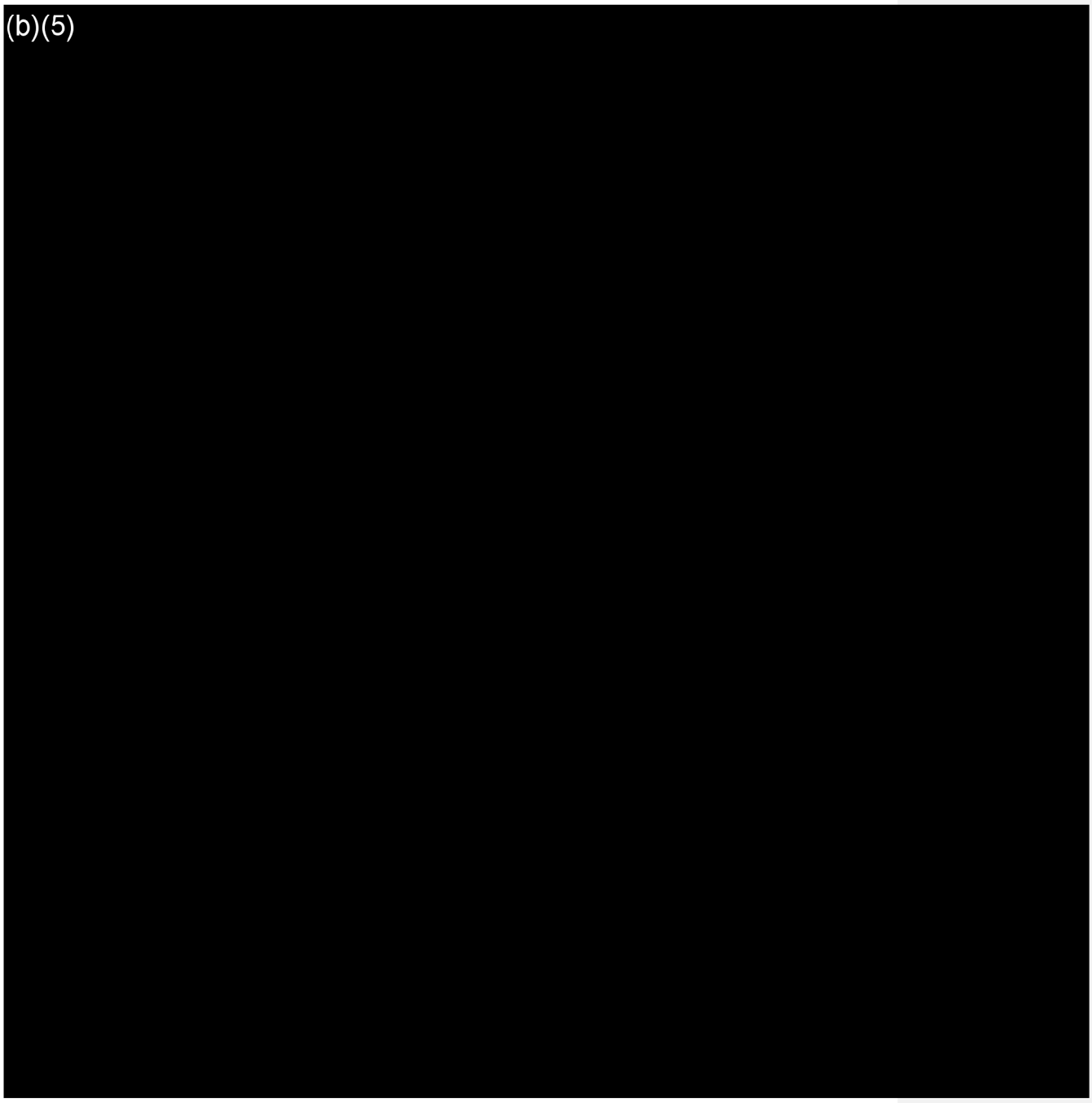

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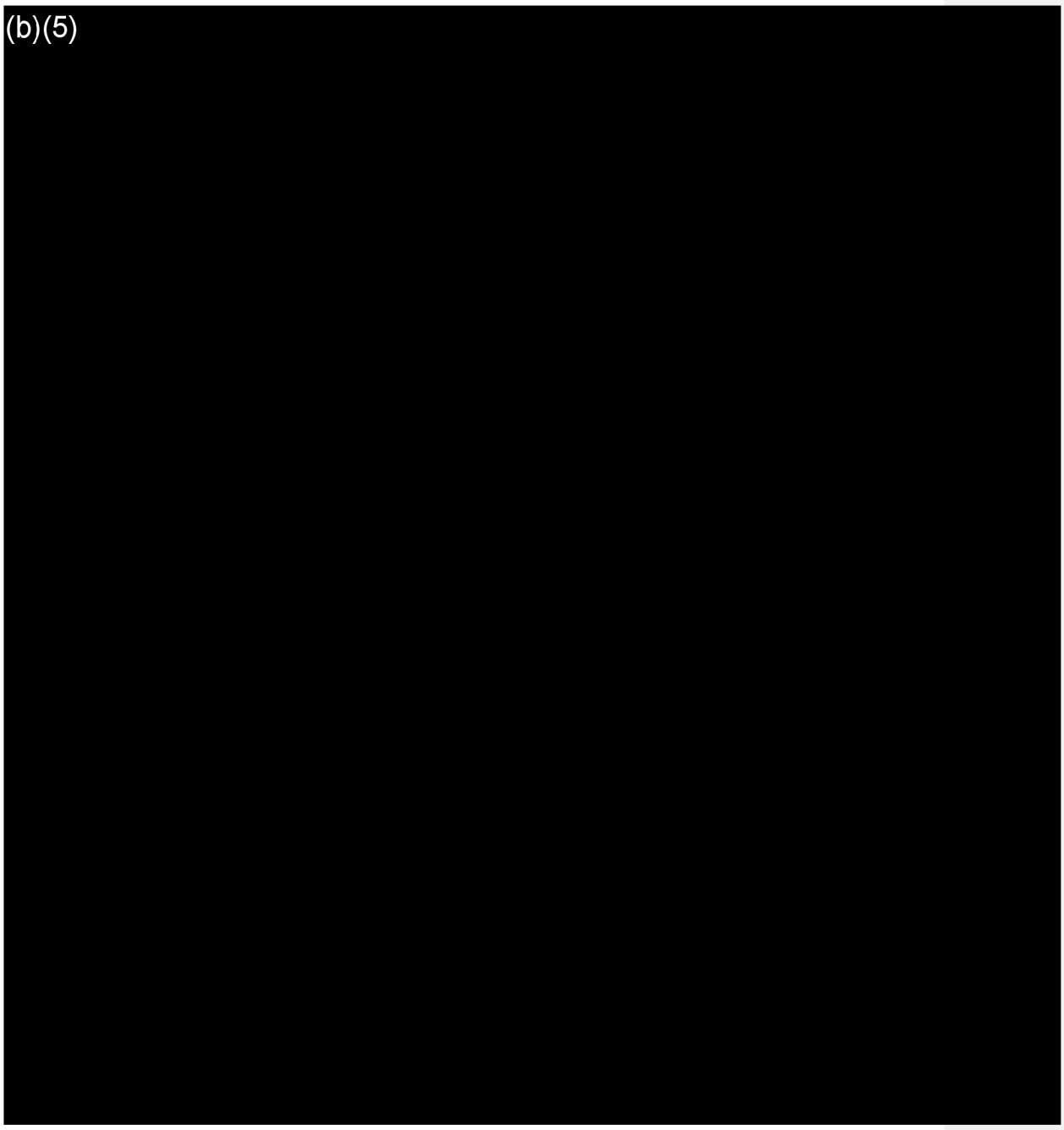

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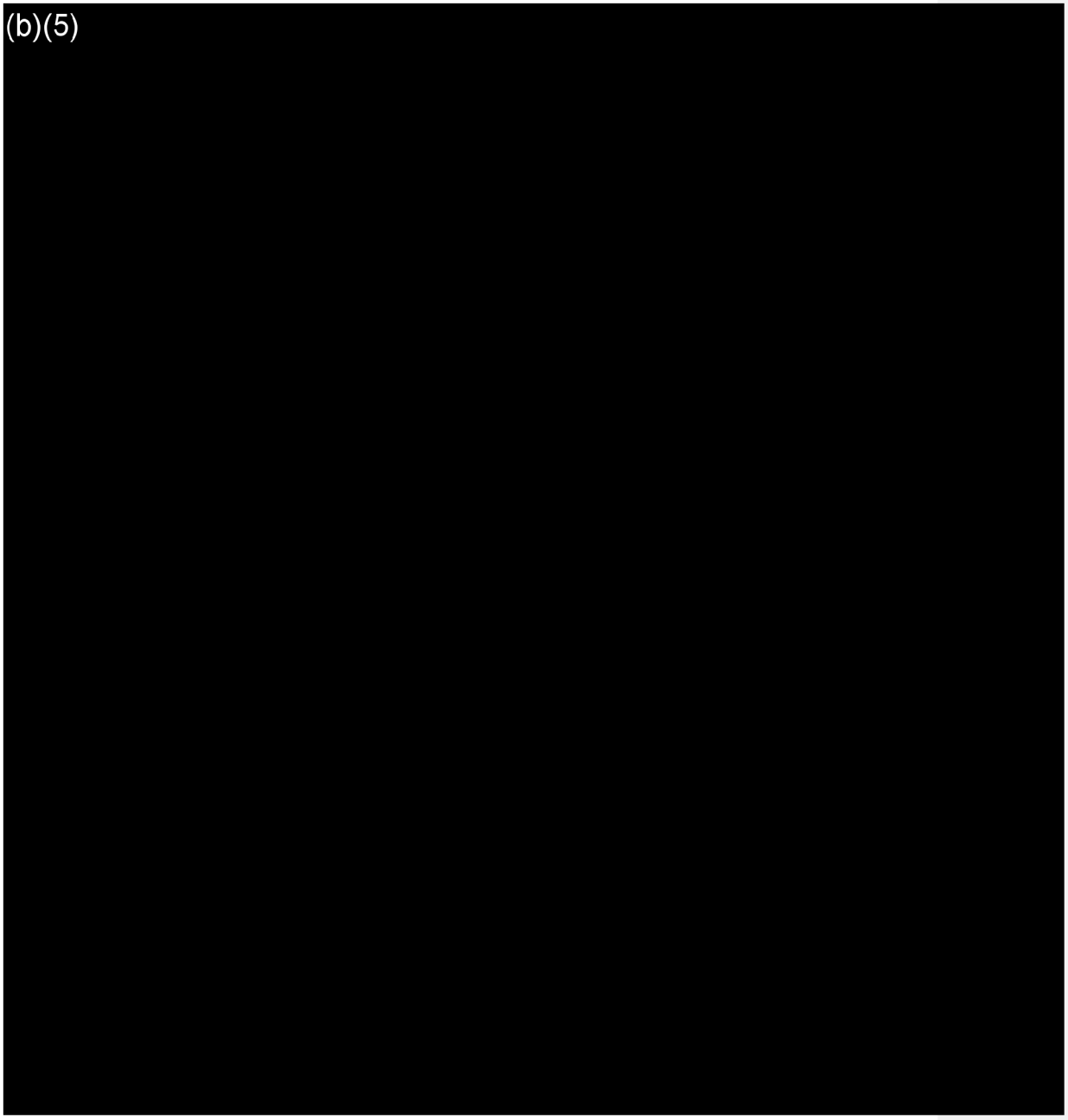

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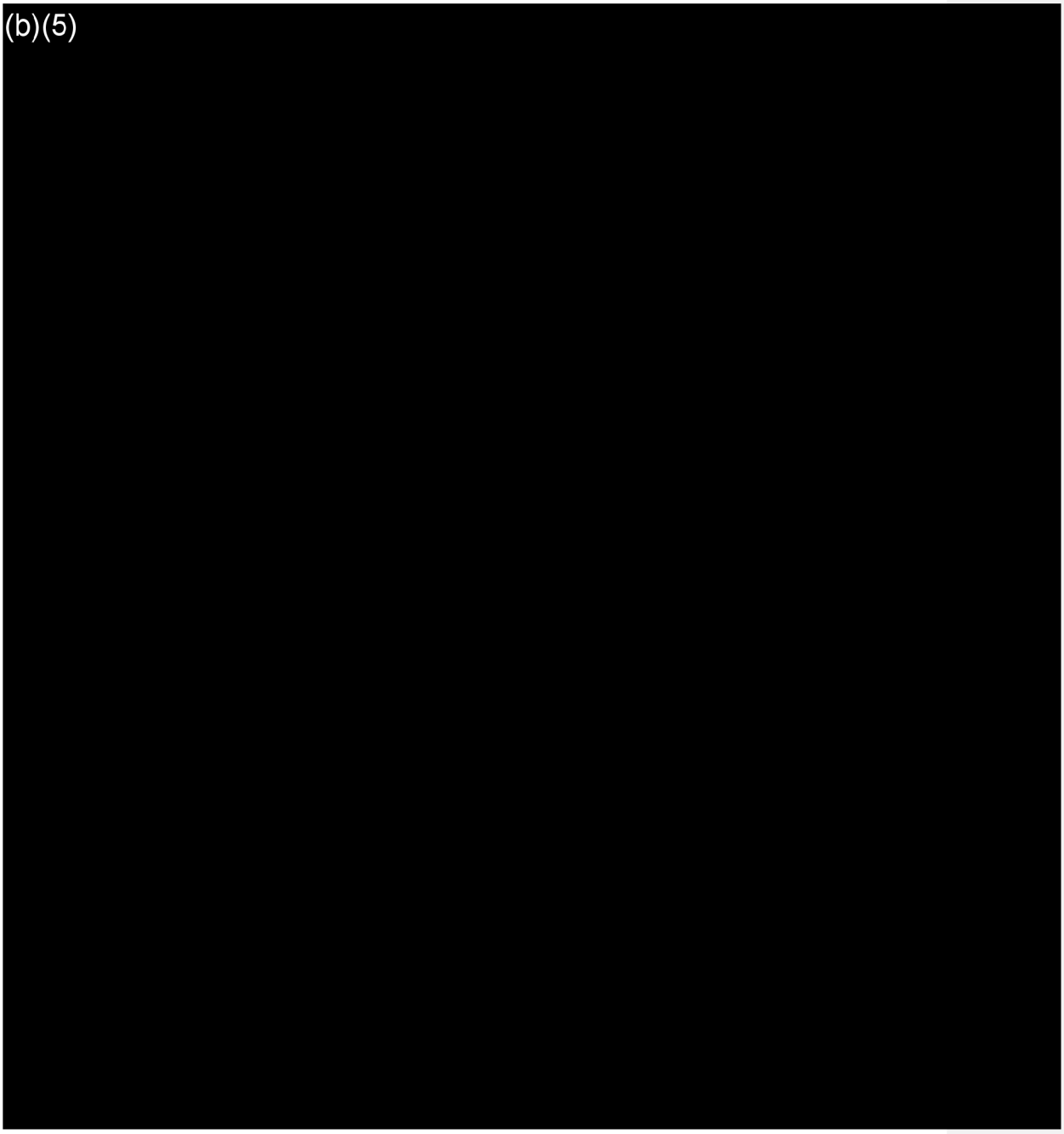

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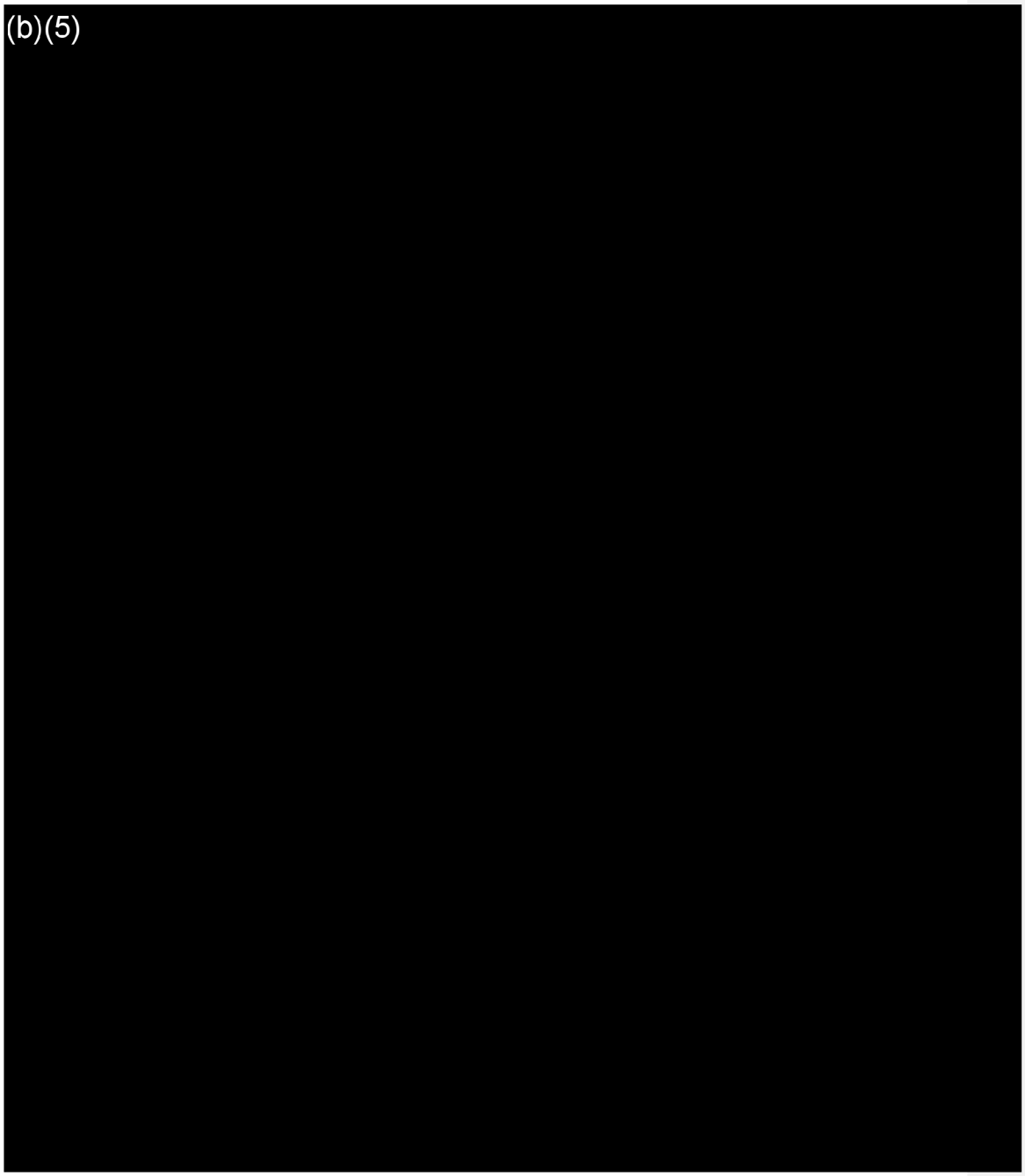

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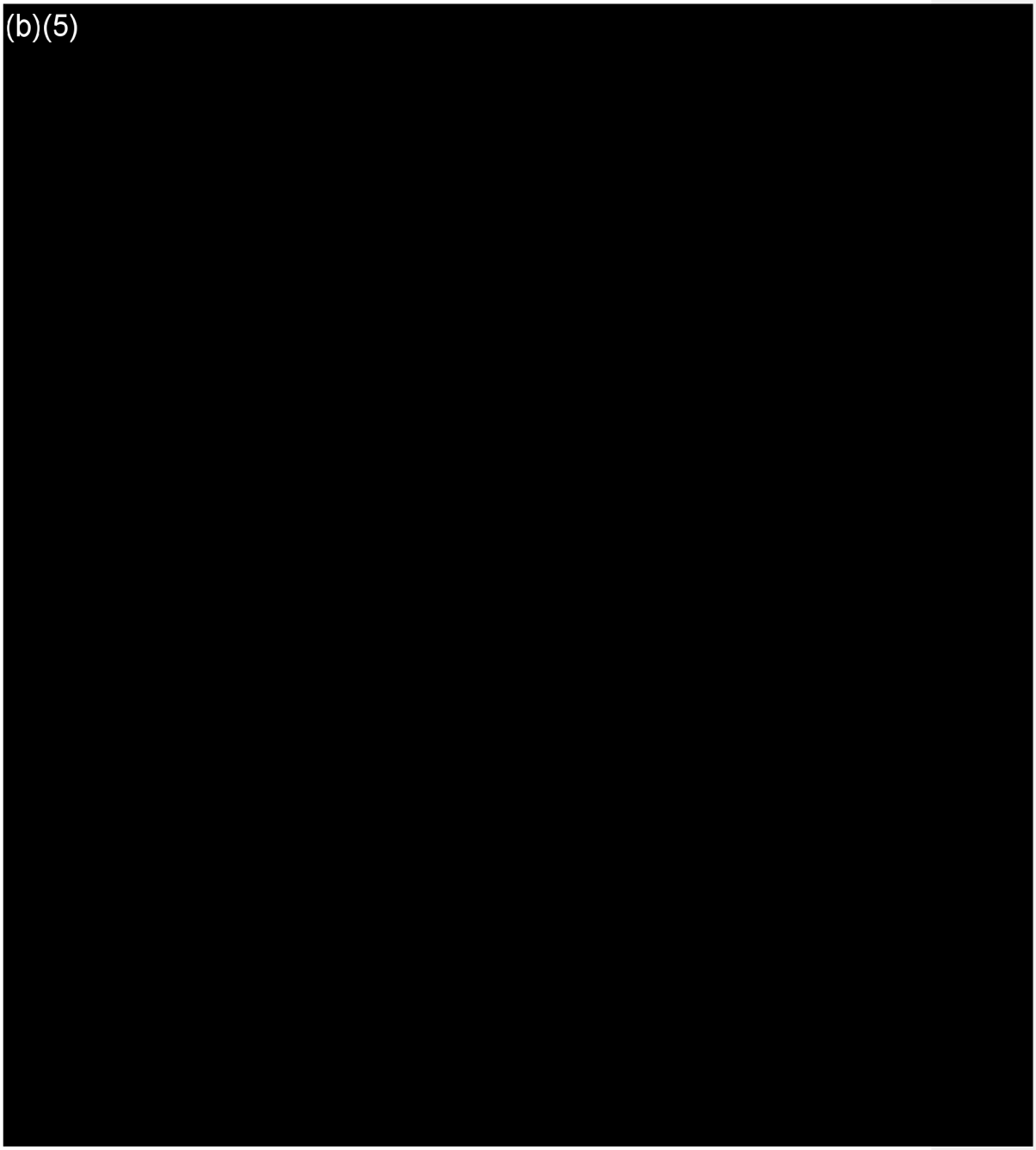

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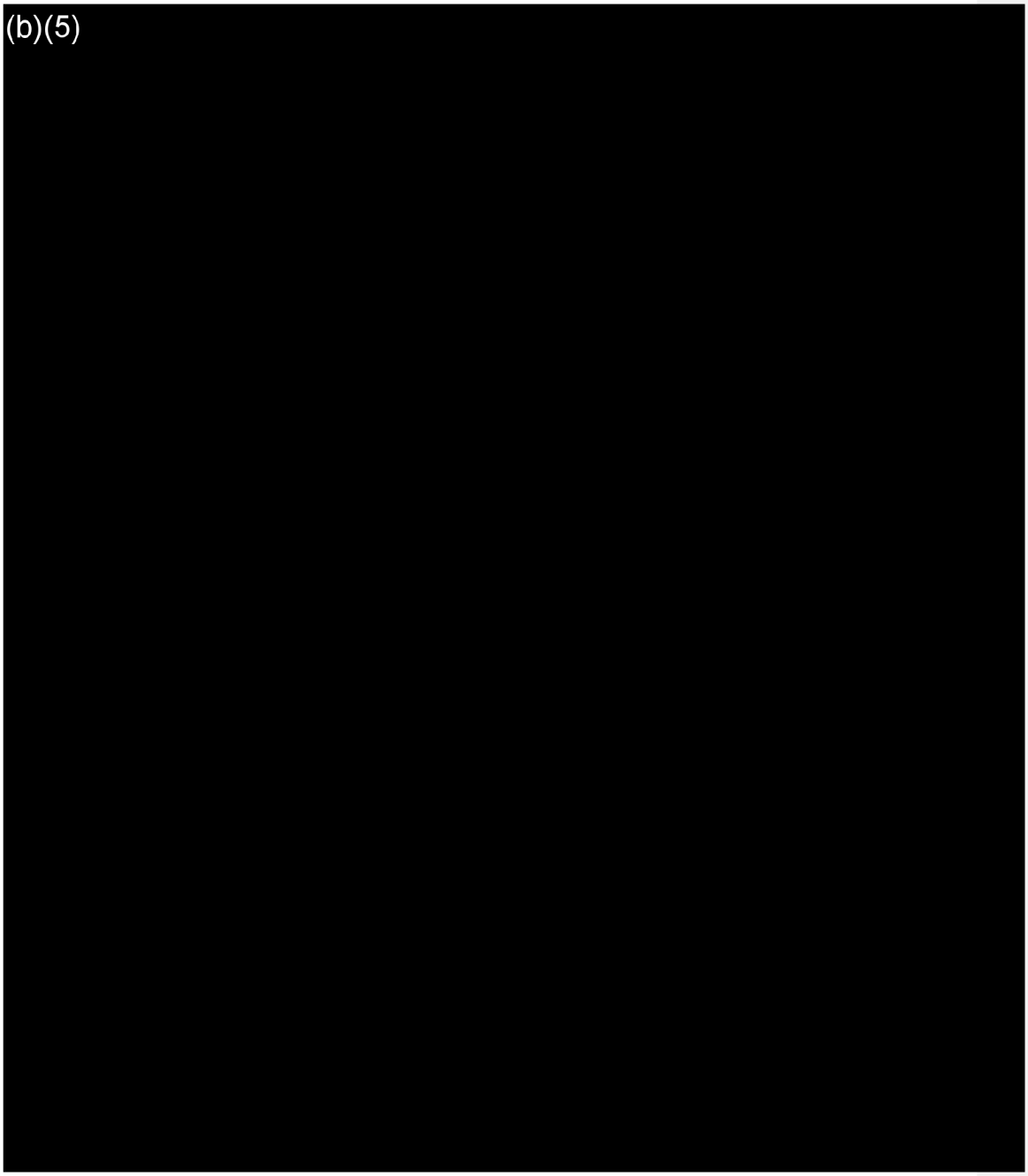

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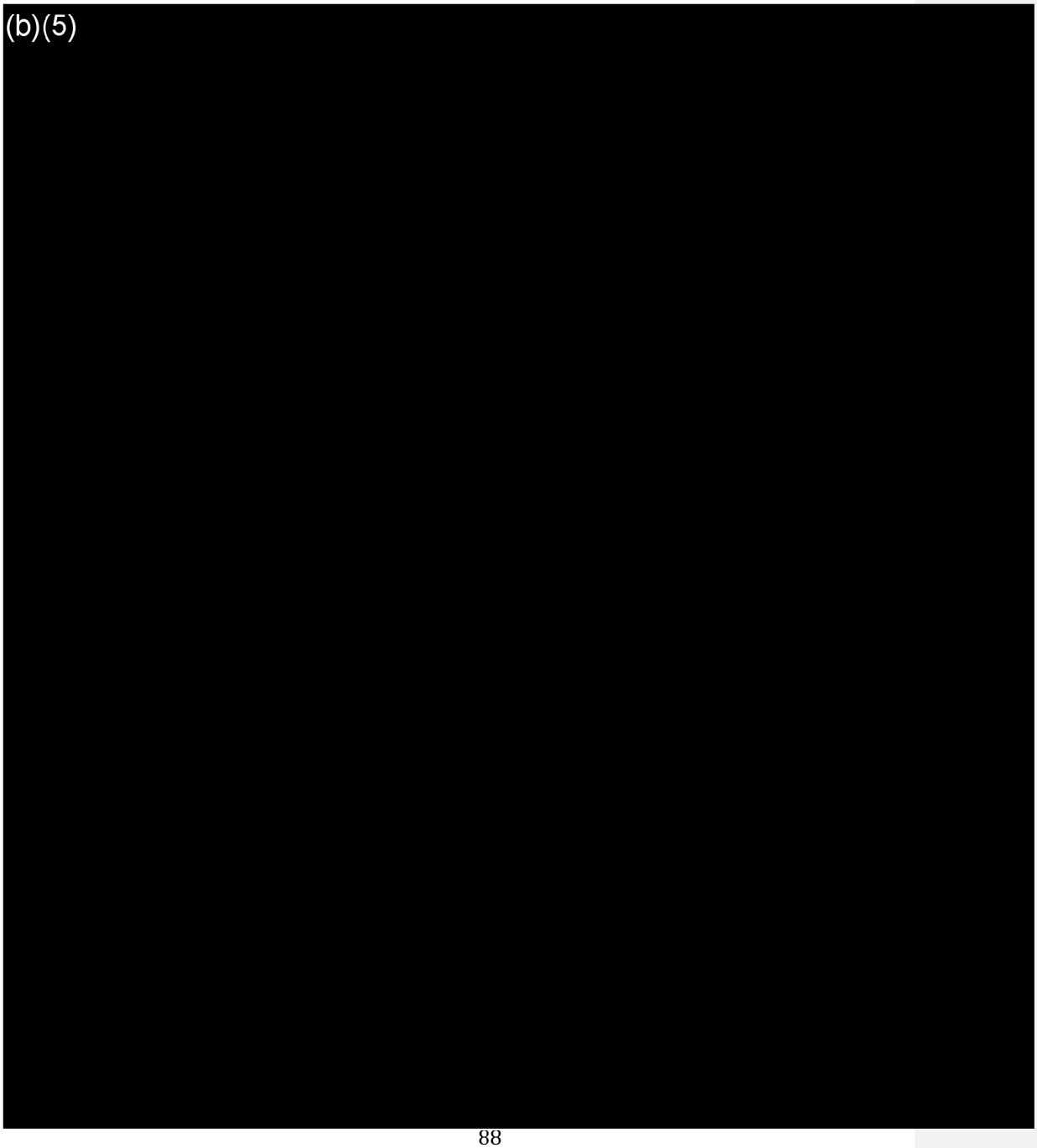

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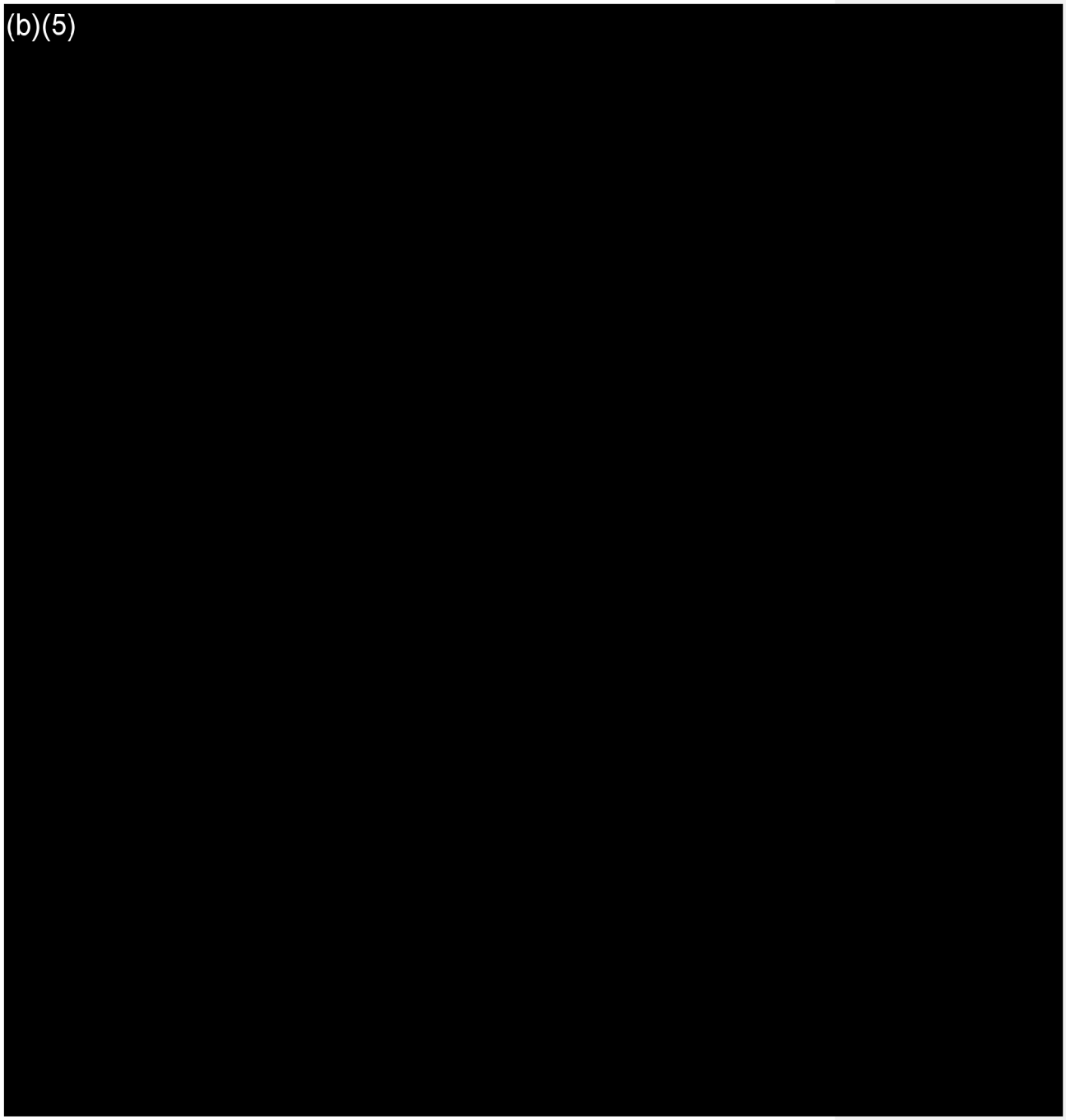

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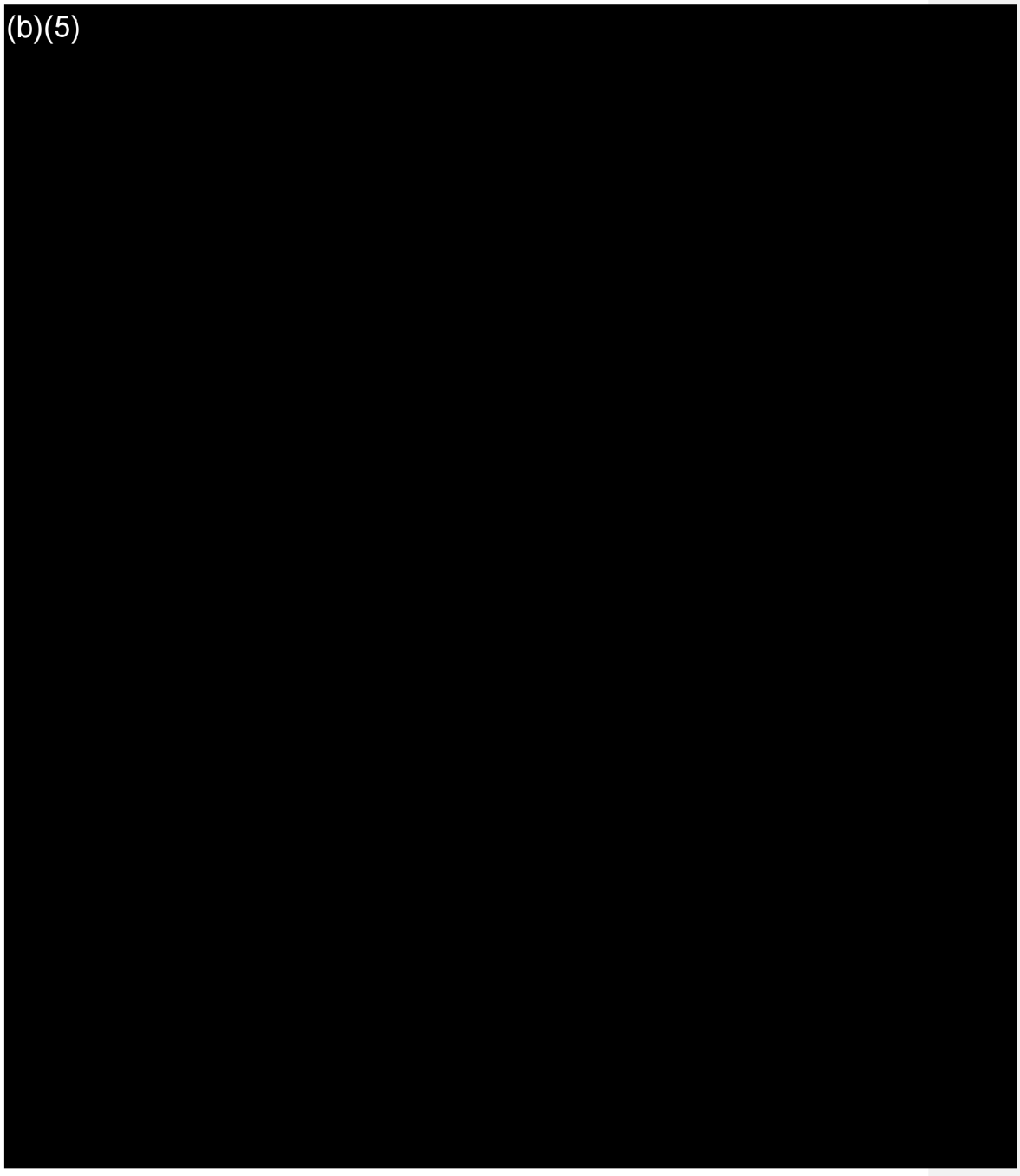

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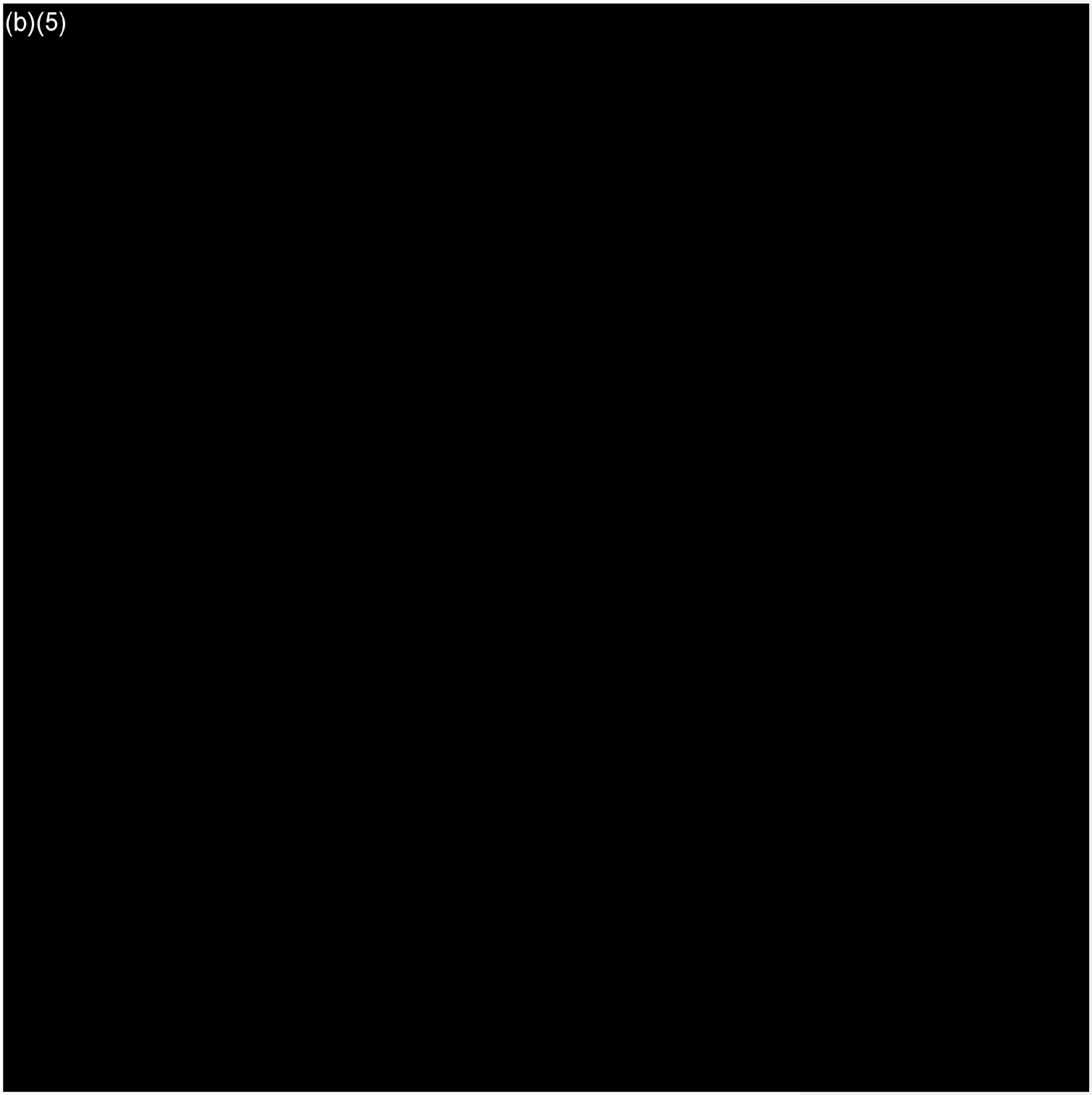

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From: Greene,Richard A (BPA) - LP-7
Sent: Mon Aug 19 12:26:03 2019
To: Gaube,Stephen J (BPA) - PTF-5; Federovitch,Eric C (BPA) - PTM-5; Haraguchi,Kelii H (BPA) - PTM-5
Subject: Pre-Review of Business Case and Surplus Notice Sections
Importance: Normal
Attachments: Preference and Surplus_SME Review.docx; Business Case for Joining the EIM_SME Review.docx

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Preference and Surplus

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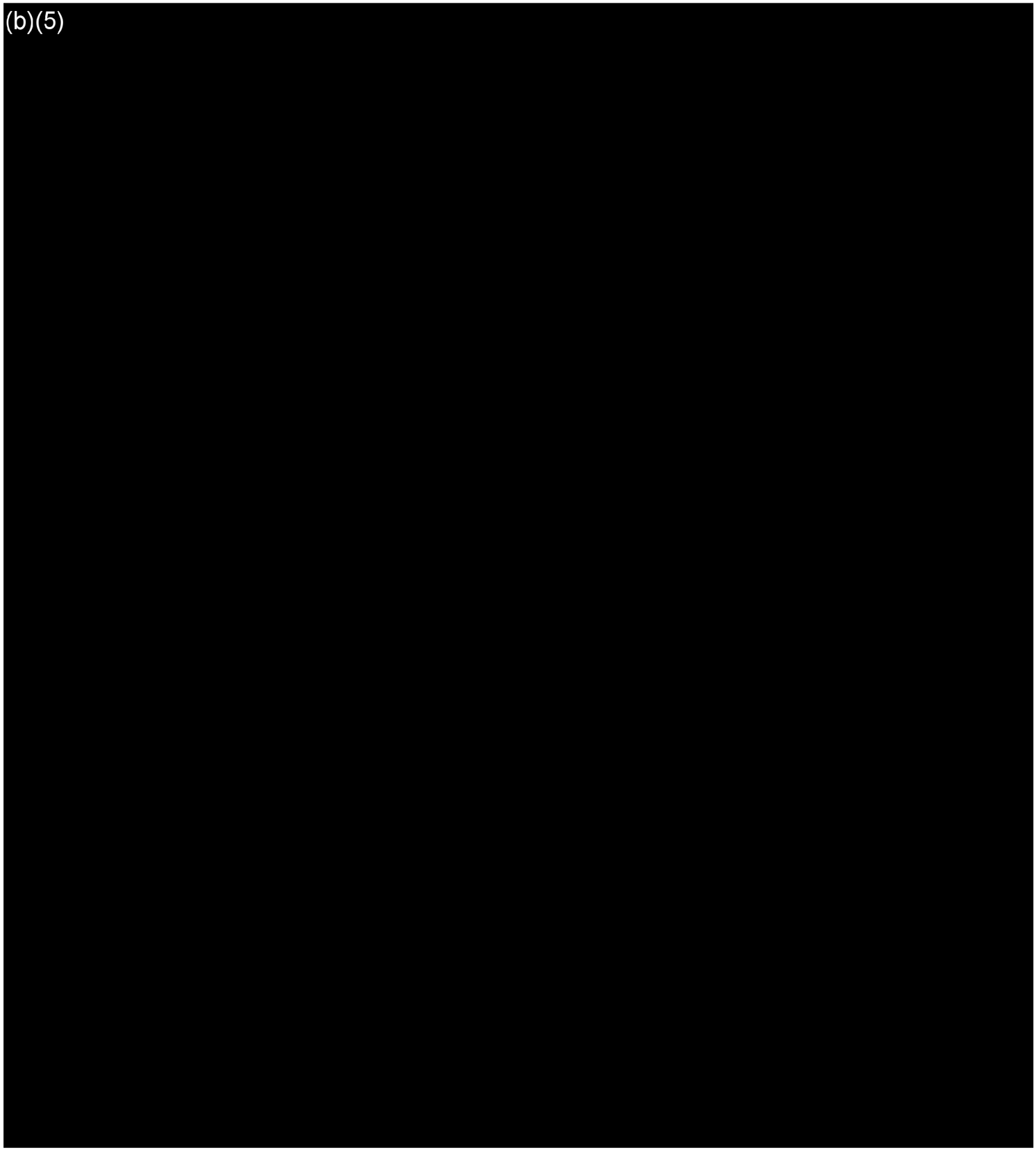

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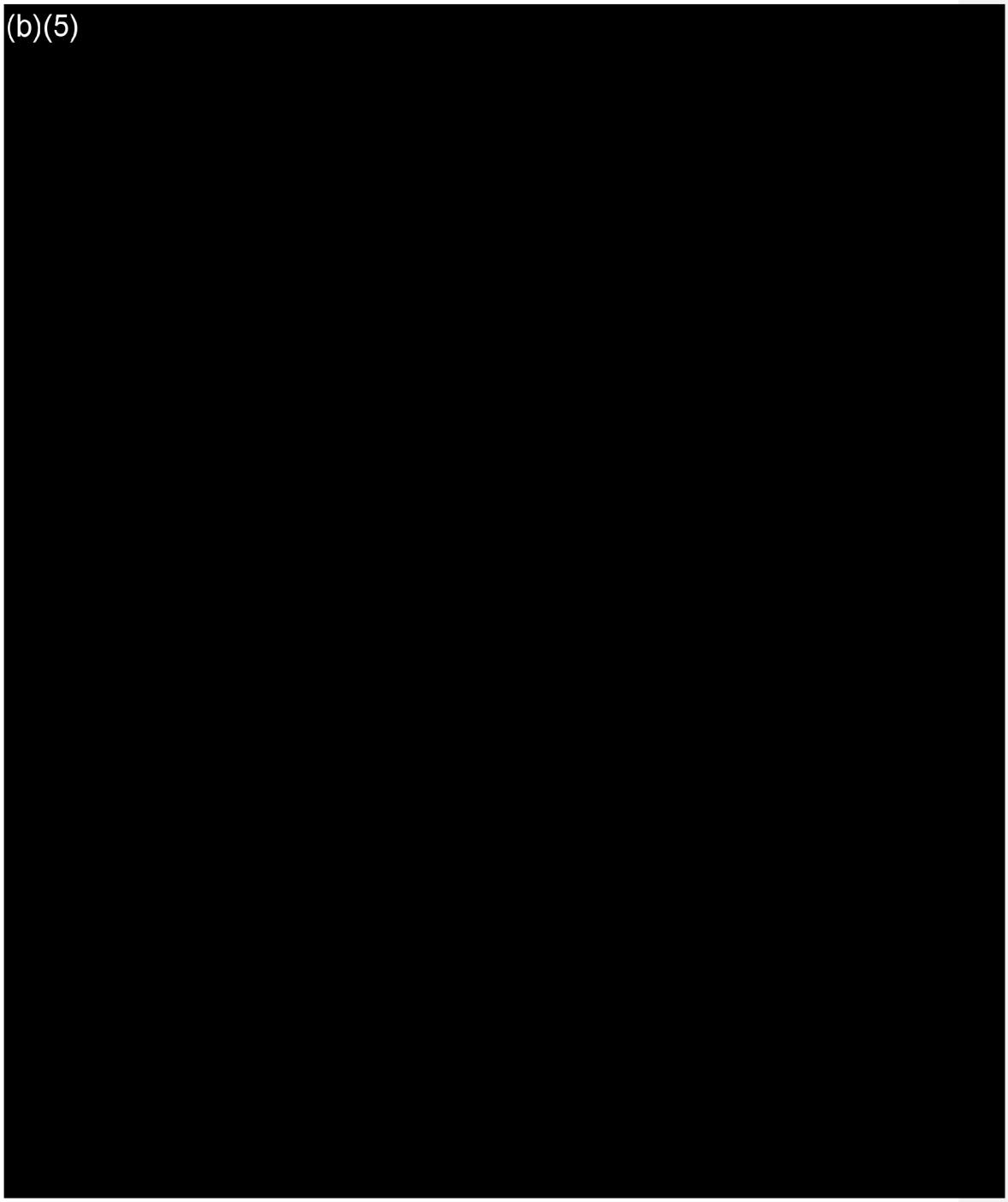

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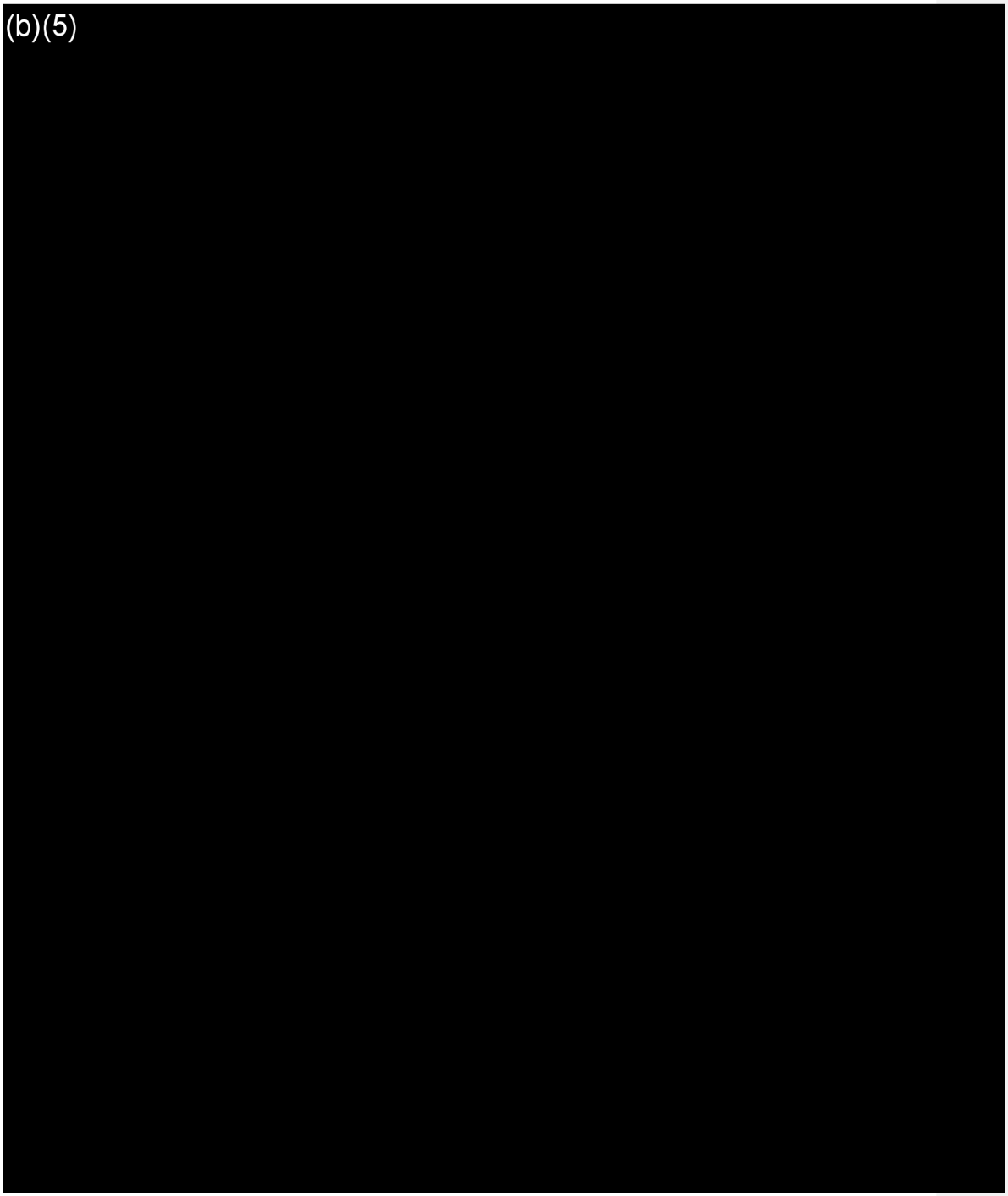

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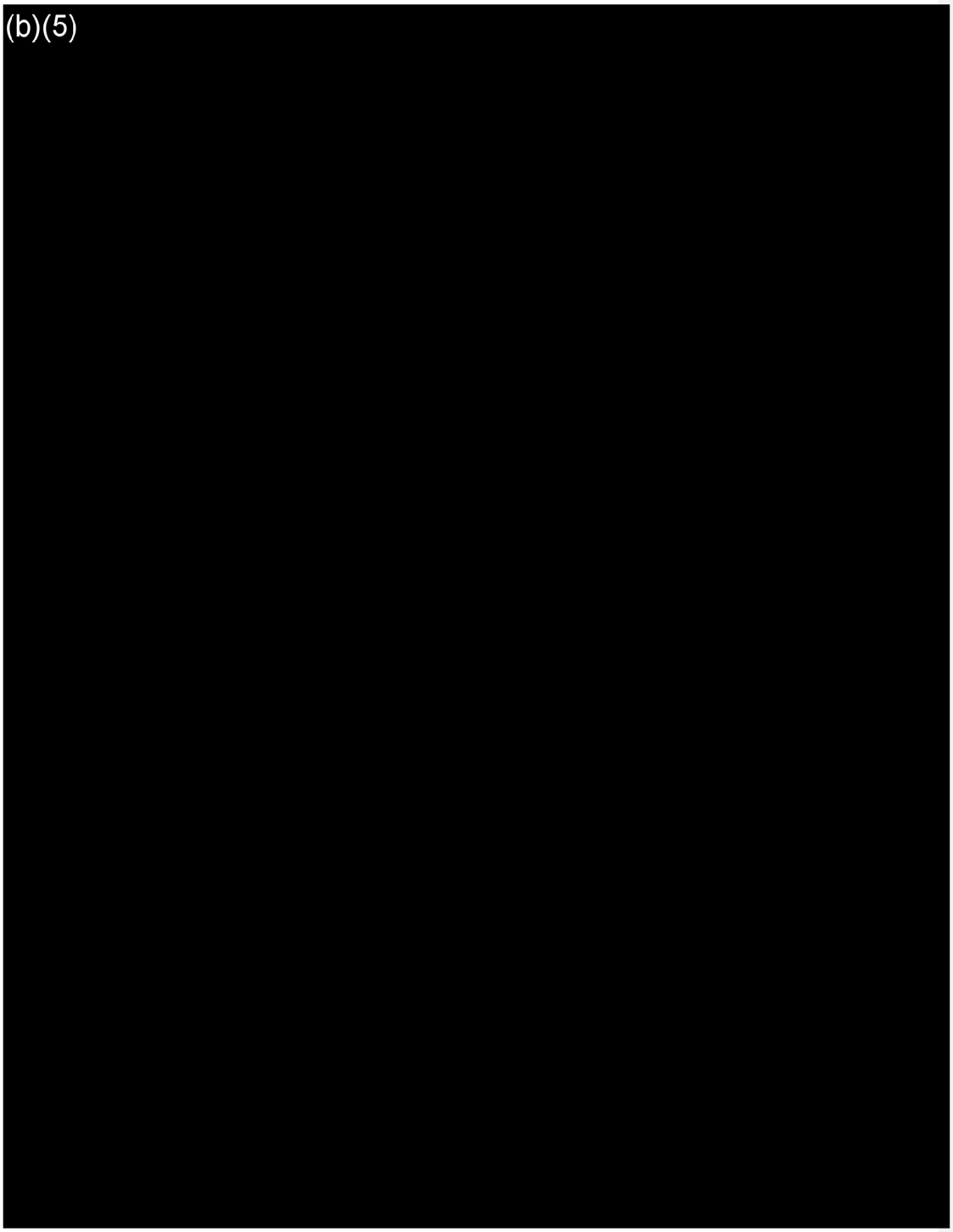

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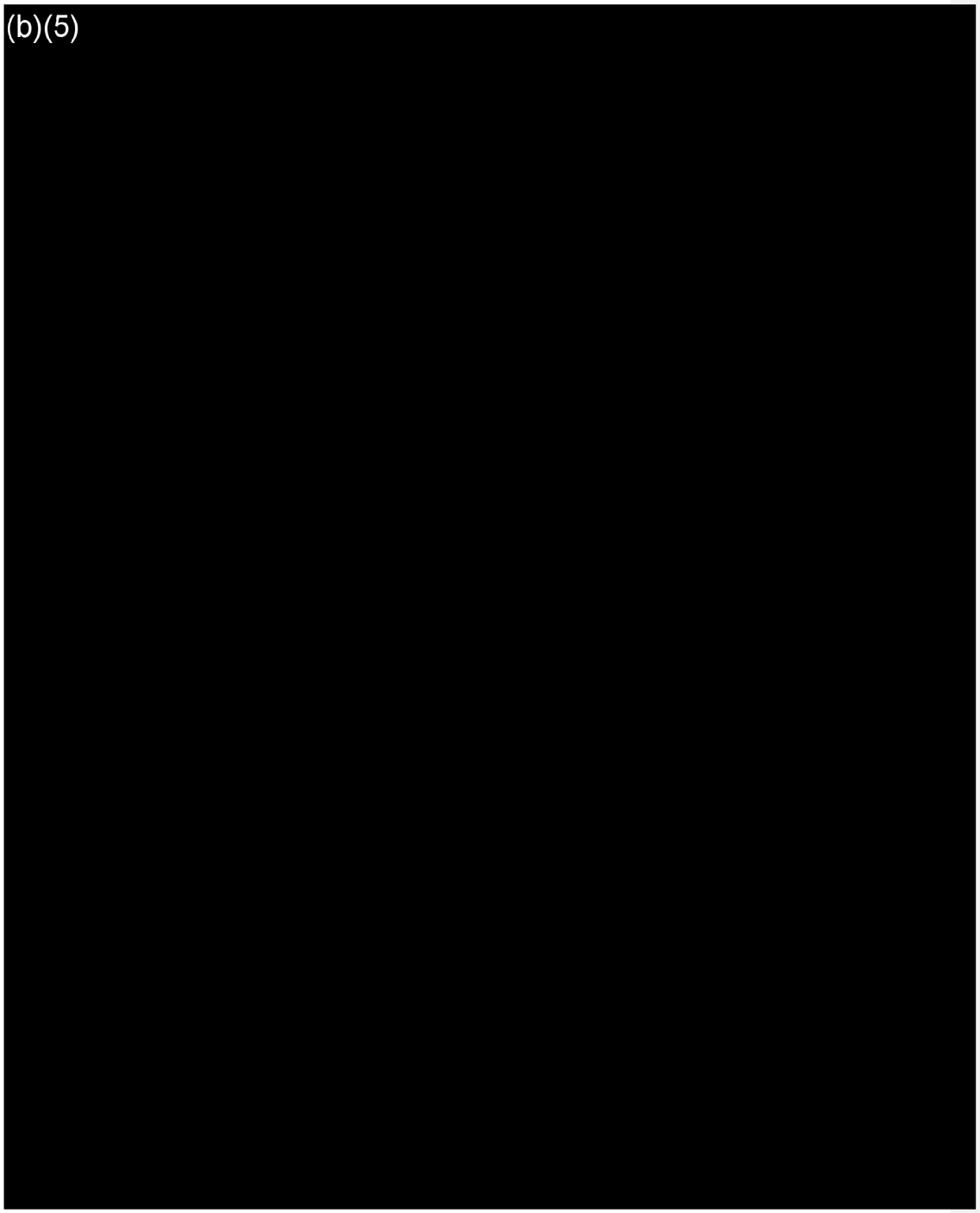

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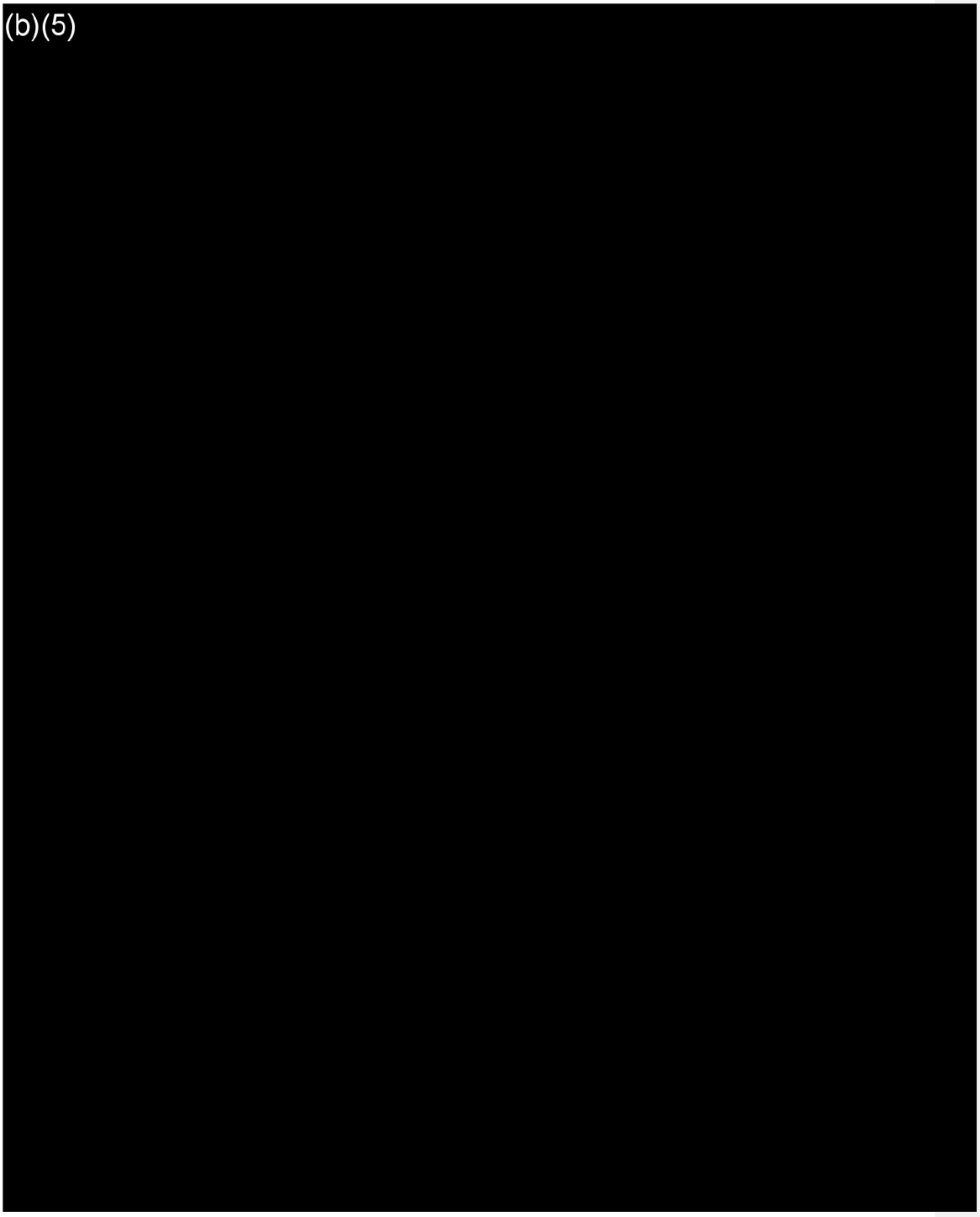

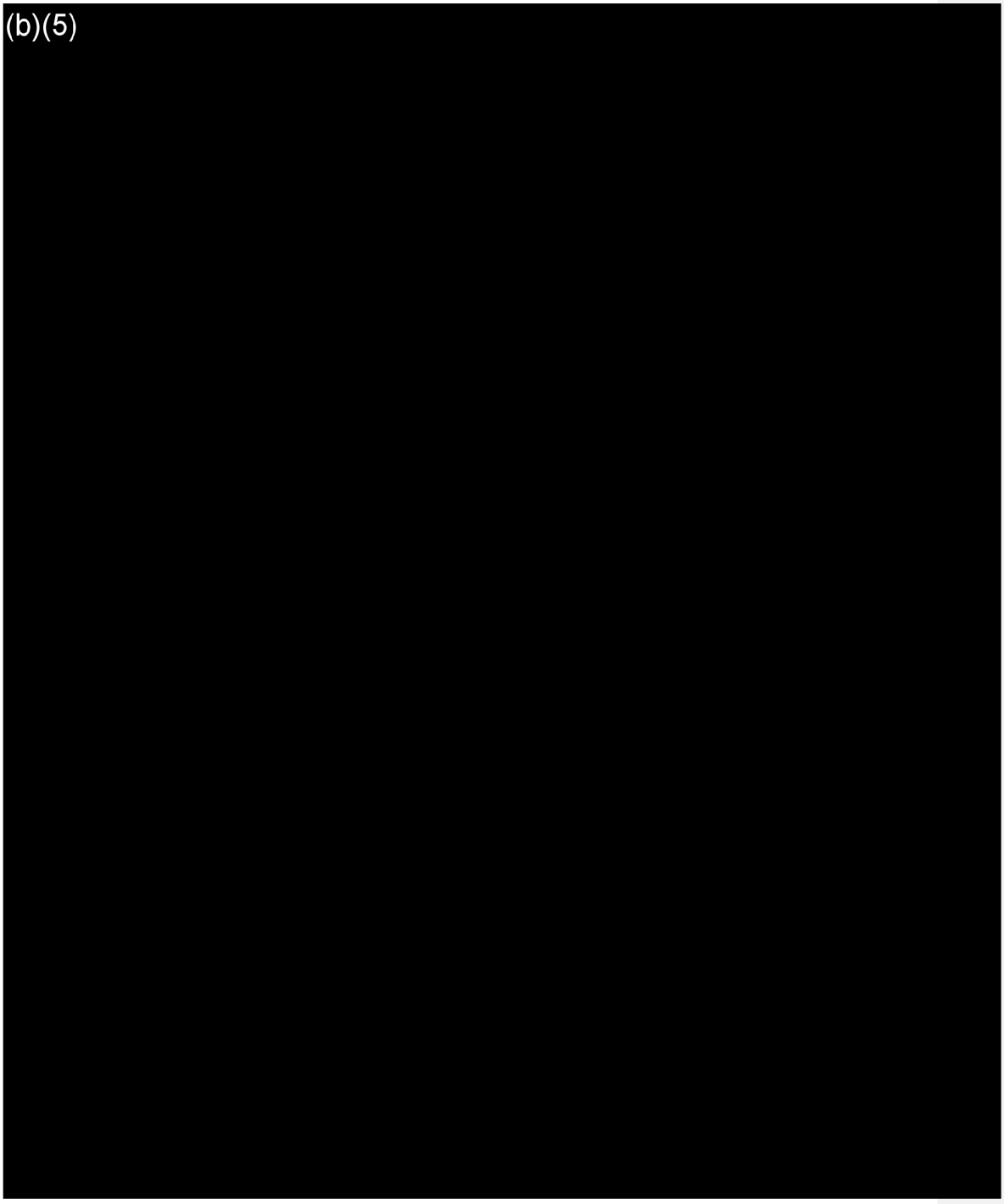
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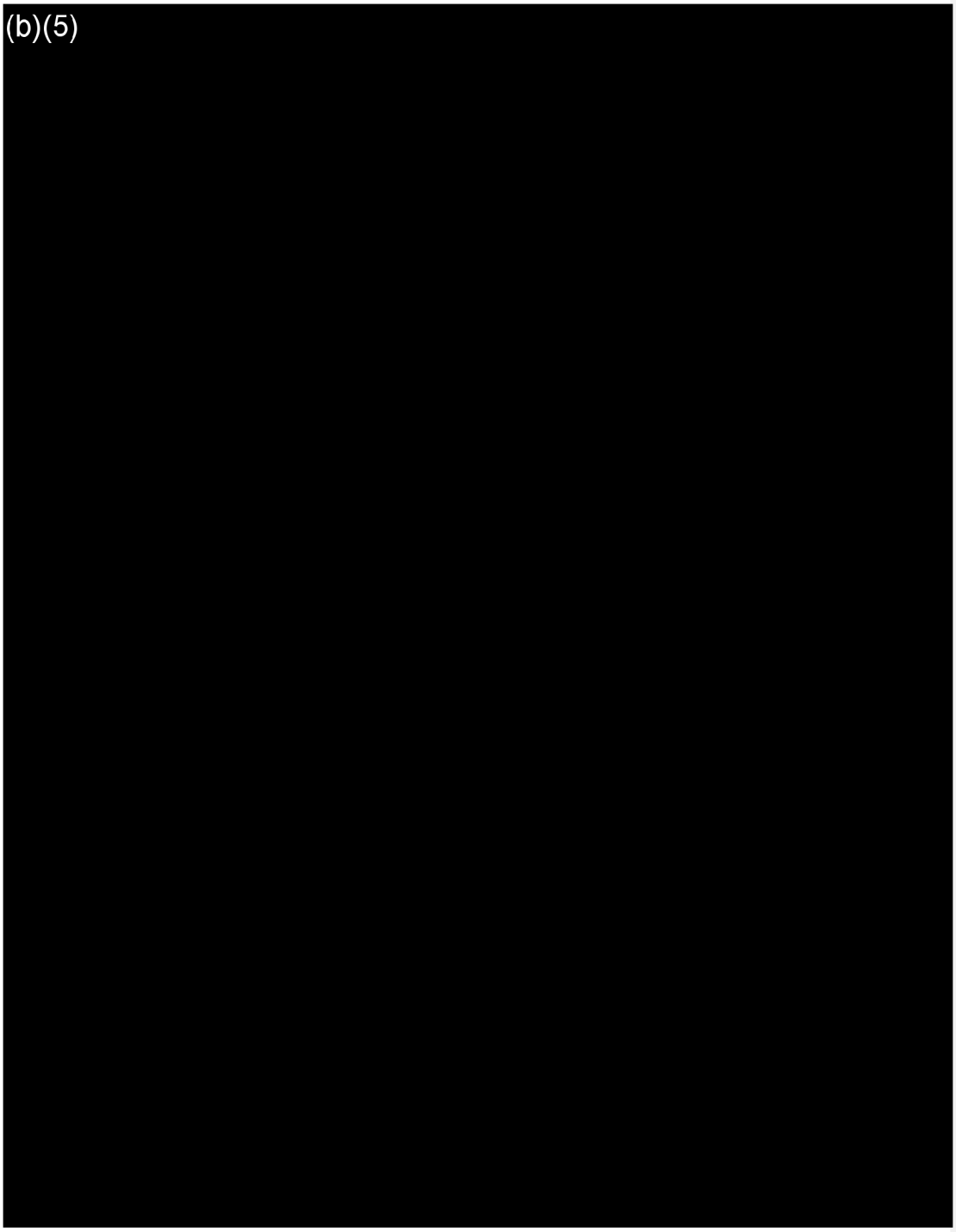

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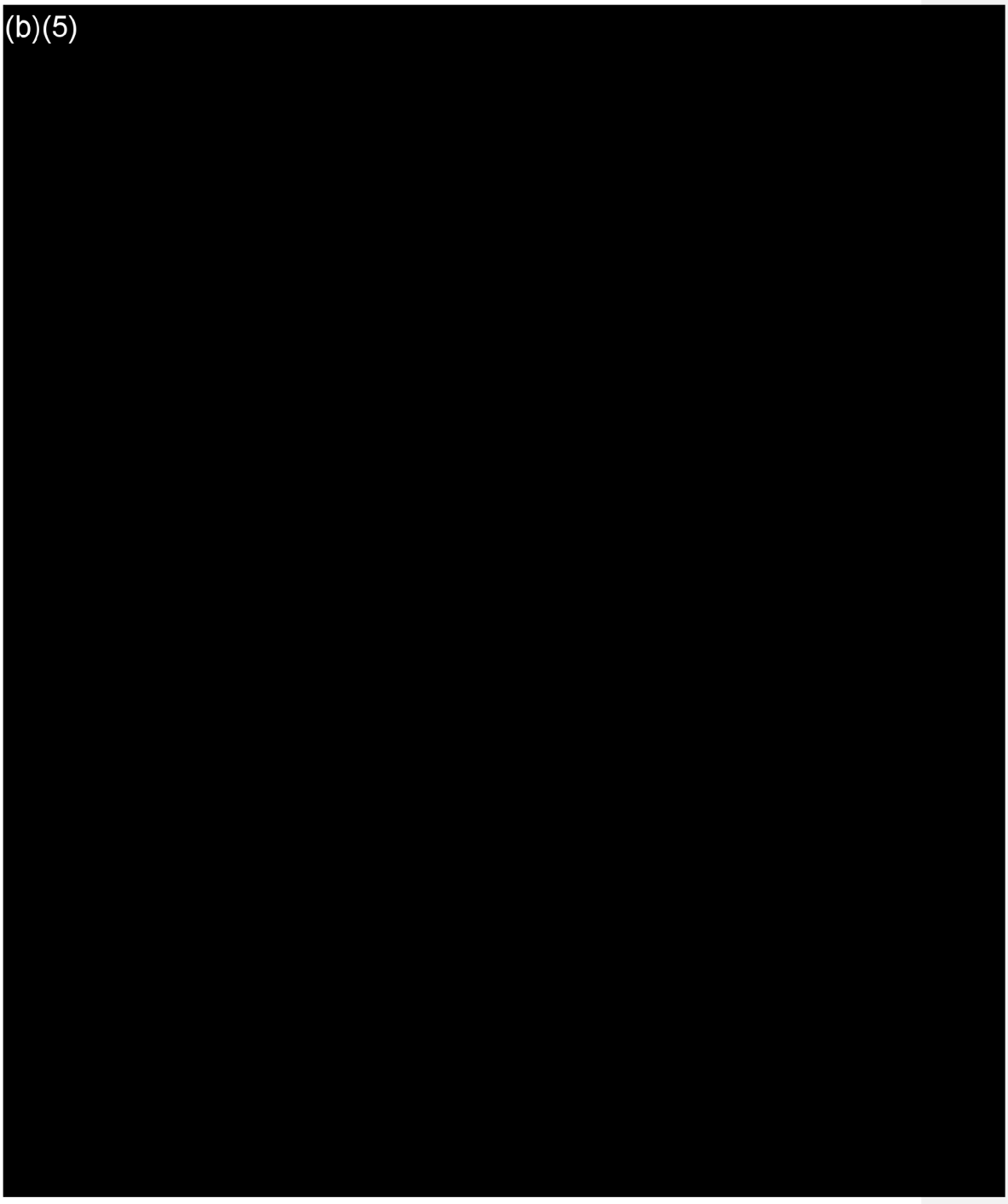

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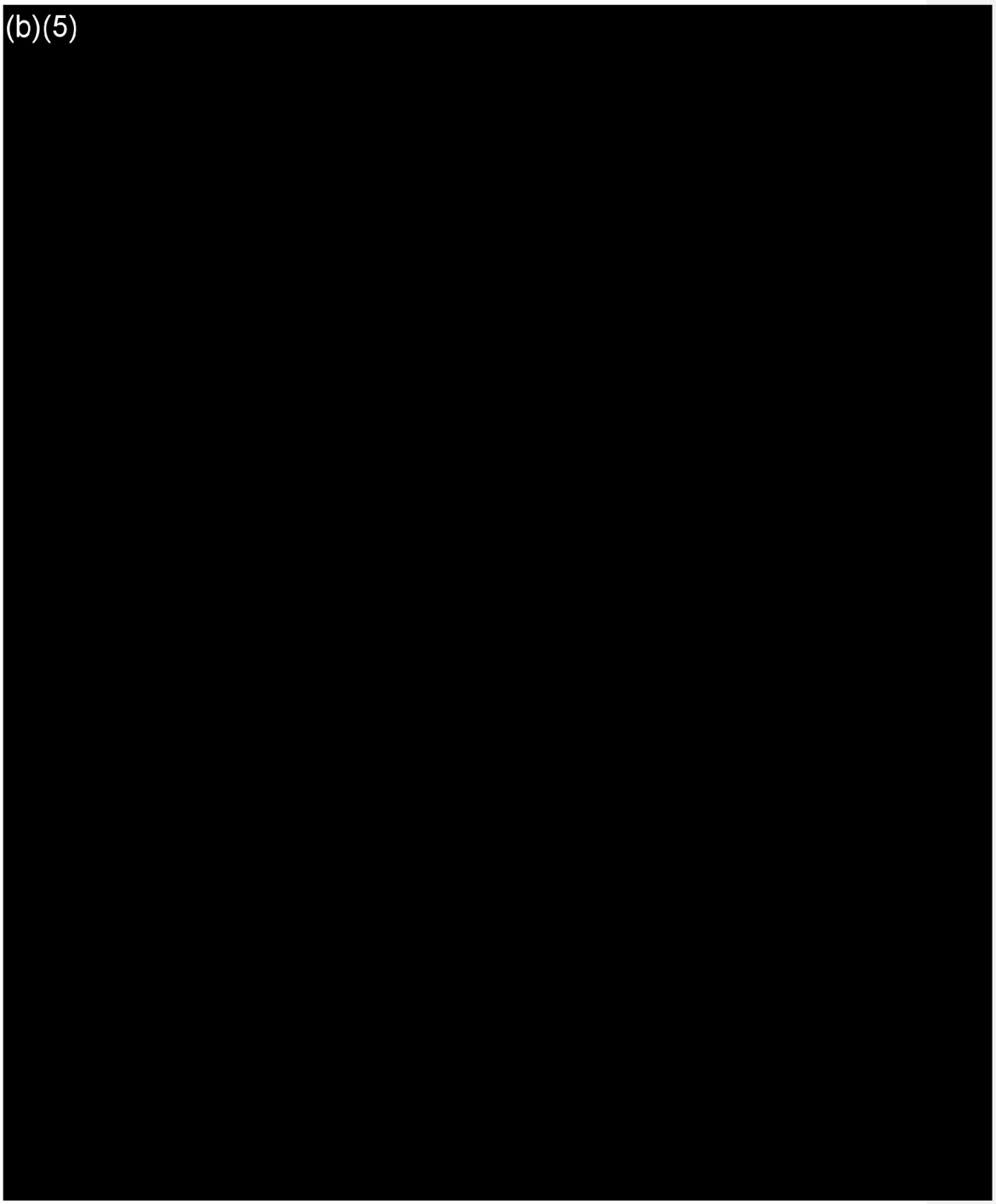

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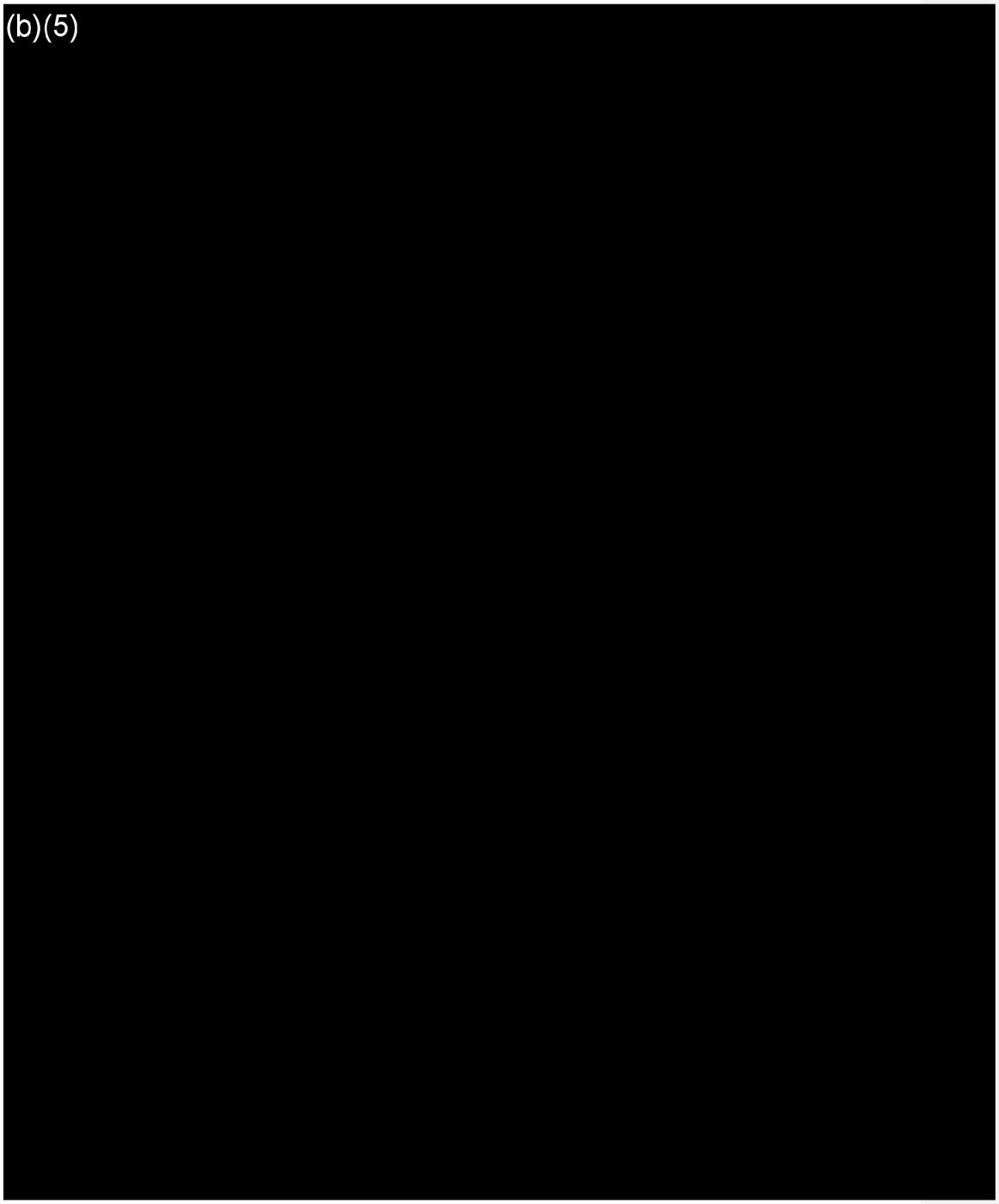

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From: Olive,J Courtney (BPA) - LP-7
Sent: Tuesday, August 27, 2019 11:07 AM
To: Greene,Richard A (BPA) - LP-7; Johnson,Tim A (BPA) - LP-7
Subject: RE: Pre-Read of EIM ROD sections
Attachments: Preference and Surplus_SME Review (JCO edits).docx

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Preference and Surplus

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ADMINISTRATOR'S RECORD OF DECISION

Energy Imbalance Market Policy

September 2019

ADMINISTRATOR'S PREFACE

This Record of Decision sets forth my decision to sign an Implementation Agreement with the California Independent System Operator (CAISO), moving the Bonneville Power Administration (Bonneville) toward joining the Western Energy Imbalance Market (EIM). This is an important milestone for Bonneville's grid modernization effort and 2018-2023 Strategic Plan. By signing the Implementation Agreement, Bonneville is transitioning from deciding whether to join the EIM to how it will join the EIM. There are still several important details to address, and a final decision to join the EIM based on certain participation principles will not be made until later in the process. However, this decision to sign an Implementation Agreement is a very significant step for Bonneville and our constituents.

Participating in the EIM is one action Bonneville has identified in its effort to modernize assets and system operations, a key goal of our strategic plan. But the decision to join the EIM must come through a collaborative effort with broad participation from across the region. To that end, I greatly appreciate the robust and thoughtful stakeholder participation and the wide array of comments received in response to Bonneville's June 20 letter and policy proposal. The comments and participation of our customers and other partners throughout the process leading up to the proposal sharpened our focus and tested our assumptions. The comments we received regarding our proposal reflect strong region-wide support for Bonneville taking this important step and indicate that moving toward joining the EIM is the right decision.

Several commenters praised the transparency and effort Bonneville staff put into the process leading up to the Proposal. It means a great deal to me as Administrator that our stakeholders have expressed this level of satisfaction with Bonneville's efforts to run an open and instructive process. We are committed to continuing transparent and open processes throughout the implementation phases leading up to the final decision to join the EIM. I ask that stakeholders continue to actively provide their constructive input to help Bonneville make the best possible decisions.

Of course, I recognize that there are still important details to work through before Bonneville is ready to start EIM operations. One of the many useful aspects of the stepwise approach of Bonneville's five-phase decision process is the EIM participation principles that are being solidified in this Record of Decision. Bonneville is committed to adhering to these principles through the remainder of the process and to using these principles as the basis for a final decision in late 2021.

BPA-2020-00784-F 0008

Many of the comments we received acknowledged the benefits of Bonneville's participation in the EIM. The comments recognize the potential value of Bonneville's participation in the EIM, particularly the opportunity to monetize the carbon-free flexibility of the federal hydropower system while helping integrate more wind and solar generation.

Bonneville has worked closely with the CAISO since the beginning of the EIM. Over the past several years, Bonneville and the CAISO have established a strong working relationship regarding market design and operational issues. The CAISO has been very helpful through the early stages of Bonneville's EIM decision process and has shown itself to be a good business partner in the negotiation of the Implementation Agreement. The CAISO has also been attentive and cooperative in addressing market issues impacting the Pacific Northwest. One example is the CAISO's recent filing at the Federal Energy Regulatory Commission regarding improvements to the Locational Marginal Price Mitigation section in its Open Access Transmission Tariff, which includes a fourth default energy bid for hydro resources. As discussed further in this Record of Decision, this change in the EIM rules addresses one of Bonneville's significant concerns with the EIM. Bonneville expects this strong partnership with the CAISO will continue as we move through implementation toward EIM participation.

As our proposal called out, the EIM is just one aspect of a well-designed energy market. Additional mechanisms are required to compensate Bonneville for the capacity value of the flexible, carbon-free federal power it chooses to provide. To that end, Bonneville sees the CAISO process to develop a day-ahead market for flexible capability, potential improvements to resource adequacy requirements, and potentially extending the CAISO day-ahead market to EIM Entities (a market feature known as EDAM) as positive future steps toward a comprehensive, well-designed market.

This Record of Decision is focused on Bonneville's potential EIM participation, but seeing these other market initiatives materialize will be of tremendous value to Bonneville, its stakeholders, and the Pacific Northwest. Signing the Implementation Agreement will also allow Bonneville to participate on equal footing with other EIM Entities in the developmental stages of these other initiatives.

I sincerely appreciate the engagement of our federal partners, the U.S. Army Corps of Engineers and Bureau of Reclamation, throughout this process. Bonneville also appreciates the insights that have been provided by those utilities that are already operating in the EIM, and we are looking forward to working more closely with the other EIM Entities as Bonneville moves through implementation toward market operations.

As we work through the remaining policy issues and other important details, we remain committed to an open, transparent process. Bonneville is only successful when it moves ideas forward through collaborative and transparent processes where all the voices of its customers and other stakeholders are heard and considered. Together, we will ensure Bonneville honors its multiple statutory obligations and continues its legacy of driving the Northwest's economic prosperity and environmental sustainability.

BPA-2020-00784-F 0008

TABLE OF CONTENTS

Executive Summary 1

1.0 Background 3

1.1 Introduction 3

1.2 The Changing Energy Landscape in the Western United States 3

1.3 Description of the EIM 9

1.4 Why Bonneville Is Considering Joining the EIM 14

Issue 1.4.1 *Whether Bonneville's participation in the EIM is expected to be beneficial to the agency and the region, and consistent with prevailing energy policy in the region.* 18

Issue 1.4.2 *Whether Bonneville's competitiveness and position in the marketplace are expected to improve by linking EIM with Bonneville's continuing pursuit of its comprehensive grid modernization initiative.* 22

Issue 1.4.3 *Whether Bonneville's interest in the CAISO's Day-Ahead Market Enhancements is an important element of Bonneville joining the EIM.* 23

Issue 1.4.4 *Whether Bonneville's consideration of participation in EDAM should happen through another stakeholder process.* 27

2.0 Decision-Making Framework for EIM Participation 29

Issue 2.1 *Whether Bonneville should adopt the proposed five-phase decision making approach to decide whether to join the EIM.* 33

Issue 2.2 *Whether Bonneville should label its conclusions that it has the legal authority and business case support to join the EIM as "preliminary" rather than "final" decisions.* 36

3.0 Determinations and Policies for Joining the EIM 49

3.1 Bonneville's EIM Participation Principles 49

Issue 3.1.1 *What foundational principles should Bonneville adopt for its potential participation in the EIM?* 51

3.2 Bonneville's Legal Authority to Join the EIM 54

3.2.1 Introduction 54

3.2.2 Sound Business Decision 55

Issue 3.2.2.1 *Whether the Administrator's decision to join the EIM furthers Bonneville's business interests consistent with its power marketing directives and legal requirements.* 57

BPA-2020-00784-F 0008

3.2.3 Preference and Surplus 58

Issue 3.2.3.1 *Whether joining the EIM is consistent with preference and surplus requirements.* 60

3.2.4 System Sales 64

Issue 3.2.4.1 *Whether Bonneville's decision to bid generation into the EIM is consistent with its obligation to make sales from the federal system.* 67

3.2.5 Transmission Service 72

Issue 3.2.5.1 *Whether joining the EIM is consistent with Bonneville's statutory authority to provide transmission service.* 73

3.2.6 Contractual Commitments 74

Issue 3.2.6.1 *Whether joining the EIM is consistent with Bonneville's contractual commitments.* 75

3.2.7 FERC Jurisdiction 80

Issue 3.2.7.1 *Whether Bonneville's participation in the EIM would change or expand FERC's limited authority over Bonneville.* 82

3.2.8 Market Oversight Under the CAISO Tariff 84

Issue 3.2.8.1 *Whether Bonneville would retain the autonomy to meet its statutory obligations given that joining the EIM would require Bonneville to agree to contractual provisions giving the CAISO certain market oversight and enforcement authority.* 88

3.2.9 Governance 88

Issue 3.2.9.1 *Whether there are any necessary changes or desired improvements to the EIM's current governance structure.* 91

3.3 Environmental Obligations 92

Issue 3.3.1 *Whether there are implications for environmental obligations from signing the Implementation Agreement?* 93

3.4 Business Case for Joining the EIM 95

3.4.1 Power 95

3.4.2 Transmission 101

Issue 3.4.1 *Whether the business case presented in the Proposal is sufficient to support Bonneville's decision that joining the EIM is a sound business decision.* 107

BPA-2020-00784-F 0008

Issue 3.4.2 *Whether the business case should be revised to include additional information quantifying the transmission costs and benefits of joining the EIM.* 120

3.5 EIM Policy Proposals 122

3.5.1 Federal Generation Participation Model 122

Issue 3.5.1.1 *What should Bonneville's plan be for federal generation participation?* 126

3.5.2 Transmission Usage – Interchange 128

Issue 3.5.2.1 *Whether Bonneville should have discretion in deciding how to make transmission available for EIM Transfers.* 131

Issue 3.5.2.2 *How should Bonneville make transmission available for EIM Transfers?* 132

3.5.3 System Operations Tools 136

Issue 3.5.3.1 *Whether Bonneville should maintain its current system operations tools if it becomes an EIM Entity.* 138

3.5.4 Carbon Obligations and Related Matters 140

Issue 3.5.4.1 *Whether Bonneville should opt out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to purchase carbon allowances.* 144

Issue 3.5.4.2 *Whether the CAISO's GHG accounting rules have potential implications for Bonneville's Asset Controlling Supplier (ACS) emissions factor.* 145

Issue 3.5.4.3 *Whether the GHG accounting practices in other states, such as Washington, will impact Bonneville's EIM participation.* 148

3.5.5 Local Market Power Mitigation/Default Energy Bid 149

Issue 3.5.5.1 *What should Bonneville's position be regarding the CAISO's Local Market Power Mitigation procedures?* 152

Issue 3.5.5.2 *Should Bonneville seek to have additional inputs for the fourth DEB?* 154

3.5.6 Load Aggregation 155

Issue 3.5.6.1 *How should Bonneville approach load aggregation?* 155

3.5.7 Resource Sufficiency – Balancing Authority Area Level 156

BPA-2020-00784-F 0008

Issue 3.5.7.1 *Whether the CAISO's resource sufficiency requirements are an impediment to Bonneville participating in the EIM.* 158

4.0 EIM Implementation Agreement 160

4.1 Background 160

4.2 Bonneville's Implementation Agreement with the CAISO 161

Issue 4.2.1 *Whether Bonneville should execute the Implementation Agreement attached as Exhibit C in the Proposal.* 164

5.0 Remaining Policy Decisions Planned for Phase III 168

5.1 Transmission Usage Network 168

Issue 5.1.1 *Whether Bonneville should address what changes, if any, are necessary to provide transmission service inside its own balancing authority area in Phase III.* 169

5.2 Allocation of EIM Charge Codes 170

Issue 5.2.1 *Whether Bonneville should consider how to allocate EIM costs and benefits as part of Phase III.* 170

5.3 Resource Sufficiency – Sub Balancing Authority Area level 173

Issue 5.3.1 *Whether Bonneville should address Resource Sufficiency at the sub-balancing authority area level as part of Phase III.* 173

5.4 Transmission Losses 174

Issue 5.4.1 *Whether Bonneville should address transmission losses as part of Phase III.* 175

5.5 Non-federal Resource Participation Requirements 176

Issue 5.5.1 *Whether Bonneville should address EIM non-federal resource participation requirements in the EIM as part of Phase III.* 176

5.6 Settlements/Billing (Mechanics) 178

Issue 5.6.1 *Whether Bonneville should address the mechanics of settlement and billing as part of Phase III.* 178

5.7 Data Submission Requirements 179

Issue 5.7.1 *Whether Bonneville should address data submission requirements as part of Phase III.* 180

5.8 Metering Requirements 180

Issue 5.8.1 *Whether Bonneville should address metering requirements as part of Phase III.* 181

BPA-2020-00784-F 0008

5.9 Other Stakeholder Proposed Topics for Phase III.....182

Issue 5.9.1 *Whether Bonneville should include the additional policy topics proposed by stakeholders in phase III.*.....182

6.0 Miscellaneous Issues.....184

Issue 6.1 *Whether the EIM is inconsistent with the bilateral market.*.....184

Issue 6.2 *Whether the EIM should be part of Bonneville's efforts to manage intra-hour transmission congestion.*.....185

Issue 6.3 *Whether the CTA will remain in effect if Bonneville joins the EIM.* 186

7.0 Conclusion.....188

ATTACHMENTS

Attachment A: Implementation Agreement

Attachment B: Energy Imbalance Market Benefits Study – Final Report

BPA-2020-00784-F 0008

Executive Summary

Purpose

This Record of Decision (ROD) documents Bonneville's decision to sign an EIM Implementation Agreement with the CAISO. It also sets forth certain foundational decisions regarding the commercial, legal, and operational aspects of Bonneville participating in the EIM. This ROD does not include a final decision to join the EIM. The final decision whether to join the EIM will be made in late 2021, following an implementation policy development process and the BP-22 and TC-22 rates and tariff terms and conditions proceedings, respectively. If Bonneville makes an affirmative final decision to join the EIM, participation would likely begin in March of 2022.

Process

Bonneville has been involved with the EIM since it was formed by the CAISO and PacifiCorp in 2014. Due to the rapid expansion of the EIM in the western interconnection since its creation, Bonneville began internal exploration as to whether it should become an EIM Entity. In July 2018, Bonneville began to hold monthly stakeholder meetings to discuss various aspects of its potential EIM participation. Bonneville started negotiating a draft Implementation Agreement with the CAISO in January 2019. These efforts culminated in the publication of Bonneville's Proposal on June 20, 2019. Bonneville received 27 comments on the Proposal by the comment deadline of July 23, 2019. Bonneville's publication of this ROD and signing of the Implementation Agreement concludes Phase II of the decision process. In Phase III Bonneville will work with stakeholders on remaining policy decisions; in Phase IV Bonneville will conduct its rate case and tariff proceeding; and in Phase V Bonneville will issue a Close-Out Letter and make the ultimate decision whether to join the EIM.

Organization of the ROD

The ROD is divided into six sections. Each section begins with Bonneville's proposal, which is consistent with what was published on June 20th. One or more issue statements are contained in each section or subsection, followed by a description of relevant stakeholder comments. The comment summary is followed by an evaluation that addresses stakeholders' comments and provides Bonneville's rationale for the decision on each issue.

The first of the six sections is an Introduction that discusses the current industry landscape, Bonneville's role and strategy, and a background on how the EIM operates. The issues addressed in this section are general in nature or pertain to industry initiatives beyond the scope of the current EIM.

BPA-2020-00784-F 0008

Section two describes the process Bonneville intends to follow to make the decisions associated with joining the EIM. The issues addressed in this section pertain to Bonneville's decision-making process and the finality of decisions made in this ROD.

The third section contains several subsections on the decisions Bonneville is making on certain foundational issues. These issues have been discussed during the stakeholder process leading up to the publication of the Proposal, including Bonneville's EIM participation principles, Bonneville's legal authority to join the EIM, business case, and seven other specific decisions on how Bonneville would participate in the EIM.

Section four discusses the Implementation Agreement and is focused on whether Bonneville should sign the Implementation Agreement.

Section five briefly discusses several key policy areas that will be addressed in the next phase, Phase III, of the process. The issues pertain to what should be included in the Phase III discussions.

Section six addresses issues raised in stakeholder comments for which Bonneville did not articulate a proposal in the Proposal document.

This ROD also has two attachments. Attachment A is an unexecuted, final version of the Implementation Agreement. Attachment B is Bonneville's Energy Imbalance Market Benefits Study, Executive Summary of Initial Results, prepared by E3.

Decisions

Bonneville views the decisions in section three of this ROD as final decisions. These include:

Bonneville EIM participation principles
Bonneville's legal authority to join the EIM
Bonneville's business case for joining the EIM
Federal generation participation model
Transmission usage-interchange
Bonneville's systems operation tools in the context of EIM participation
Carbon issues
Local market power mitigation/default energy bid
Load aggregation
Resource sufficiency – balancing authority area level

While all of these are described as final decisions, they are predicated on the understanding that if there are significant changes in underlying facts or in the way the EIM operates, the decision will be revisited before a final decision to join the EIM is made in late 2021.

BPA-2020-00784-F 0008

1.0 Background

1.1 Introduction

The Bonneville Power Administration (Bonneville) has proposed to sign an Implementation Agreement, which is a necessary first step to join the California Independent System Operator's (CAISO) Western Energy Imbalance Market (EIM). As part of its decision, Bonneville prepared a Letter and Policy Proposal document (Proposal) to describe the legal, business, operational, and policy considerations associated with joining the EIM. The Proposal was published on June 20, 2019, with a request for comments due on July 22nd. The Proposal was the culmination of Bonneville's initial findings on these matters. The majority of the content set forth in the Proposal had previously been discussed with stakeholders through monthly public meetings that Bonneville began in July 2018.

The Proposal included a cover letter from the Administrator, which explained that the decision to sign the Implementation Agreement will signal Bonneville's intent to join the EIM as long as certain principles are met during the implementation process and the remaining policy issues are resolved prior to beginning financially binding transactions in the market (go-live) in 2022. The decision to sign the Implementation Agreement is the first of several decisions that need to be made before Bonneville could begin market participation.

The remaining portion of this section describes: (1) the changing energy landscape in the Western United States; (2) what the EIM is and how it operates; and (3) why Bonneville is interested in EIM participation.

1.2 The Changing Energy Landscape in the Western United States

Changes in the Energy Industry

The energy industry is experiencing fundamental changes in structure that continues to directly impact Bonneville's operations and commercial value. These industry-wide changes are driven by the significant expansion of variable energy resources (VERs) output, as well as the need to maximize the utilization of existing transmission capacity prior to embarking on expensive and time-consuming transmission expansion efforts. VERs are getting cheaper to build and operate.[1] Regional public policy makers and end-use

[1] *See* 2018 Annual Technology Baseline, National Renewable Energy Laboratory, *available at* https://atb.nrel.gov/electricity/2018/index.html?t=in.

BPA-2020-00784-F 0008

consumers are also demanding a cleaner mix of energy resources.[2] Since 2010, generation output from variable energy resources in the West has grown by 150% while generation output from other resource types has been flat or declining.[3]

Long-line transmission is expensive to build, operate, and maintain, and, moreover, many people do not want transmission lines in their backyards. In 2017, Bonneville decided to defer its own transmission build option through the South of Allston transmission constraint.[4] This was due in part to costs, local opposition, and the emergence of non-wires options—including the possibility of joining the EIM—that were proving effective at reducing flows through South of Allston and were helping Bonneville address transmission service requests on that path.[5] While the EIM helps maximize the use of the existing transmission system, additional transmission reinforcements will likely be needed in the future.

For decades, these high-level trends have worked together in other parts of the U.S. to stimulate the adoption and expansion of organized markets. Regional Transmission Organizations (RTOs) are able to increase generation in some areas and simultaneously decrease generation in others—known as re-dispatch—across a broad market footprint to maximize the use of the existing transmission grid, alleviating pressure to build new transmission lines. The same re-dispatch of generation can also reliably and efficiently ease the integration of VERs.

The uncertainty of wind and clouds—which cause VERs to vary moment-to-moment and throughout the day—can be matched with the near instantaneous demand from load by calling on the least cost generator(s) in a larger, diverse geographic area that have the available generation capability to ramp up or down. However, with the exception of the CAISO, the Western U.S. had not been able to formulate a viable region-wide organized market until November 2014, when PacifiCorp and the CAISO initiated the EIM.

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[2] Washington, Oregon, and California have all passed or are considering legislation to implement zero-carbon policies.

[3] Short-Term Energy Outlook, DOE (May 2019), *available at* http://www.eia.gov/outlooks/steo/.

[4] See, for example, Bonneville's decision not to build the I-5 Corridor Reinforcement Project, citing the size, local impacts, and increasing costs as reasons to not build the proposed project. Bonneville Power Admin., I-5 Corridor Reinforcement Project Decision Letter (May 17, 2017), *available at* https://www.bpa.gov/Projects/Projects/I-5/Documents/letter_I-5_decision_final_web.pdf.

[5] Bonneville's Non-Wires SOA Pilot Summary Results, slide 4 (Dec. 10, 2018), *available at* https://www.bpa.gov/transmission/CustomerInvolvement/Non-Wire-SOA/Pages/Meetings.aspx. "BPA acquired two years of incremental and decremental capacity and energy (deployed with day-ahead notice) to reduce flows on SOA flowgate during summer peak periods. . . . Non-wires portfolio balances 200 MW of incremental capacity with 200 MW of decremental capacity to provide counter flow." *Id.*

BPA-2020-00784-F 0008

Until that time, the rest of the West had utilized bilateral markets to buy and sell electricity. As zero variable cost energy supply from VERs has increased in the CAISO's organized markets, downward pressure has been exerted on energy prices inside the CAISO and this has extended into bilateral markets in the West. At the same time, natural gas prices have fallen as increasingly efficient extraction techniques have emerged. This too has driven electricity prices lower. On the other hand, the need for capability produced by generation resources that are carbon free and flexible has been growing. Bonneville markets federal hydroelectric power (energy and capacity) and anticipates demand for this capacity will continue to increase in the West.

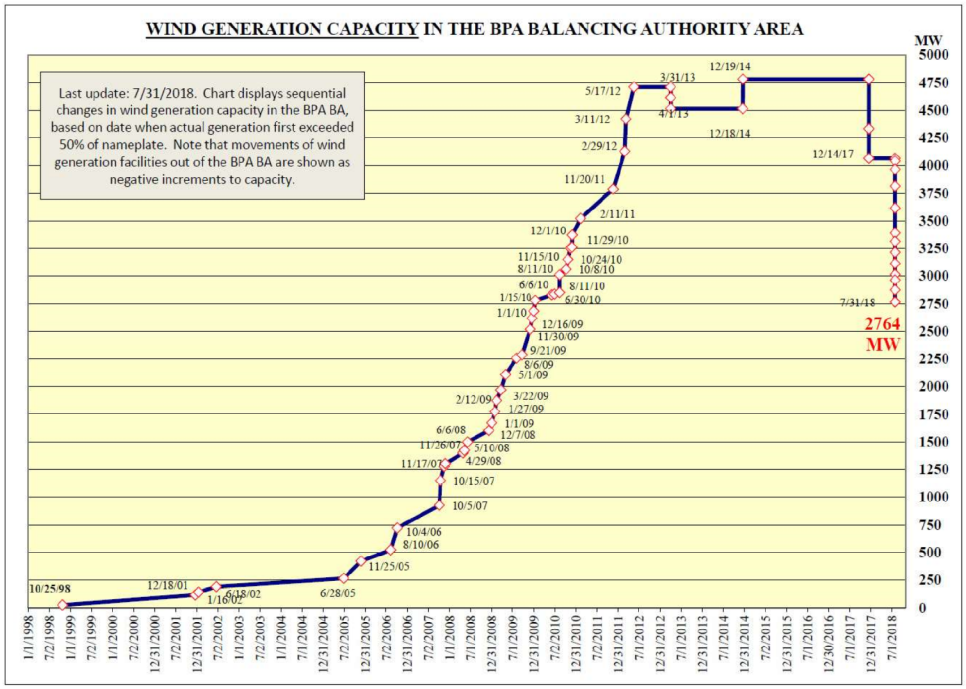
The Effect of the Changing Energy Landscape on Bonneville

Bonneville has been navigating these industry-wide changes. Bonneville has increased sales of long-term firm transmission in the past 10 years, allowing Bonneville to operationally integrate the most diverse set of generating resources into the Federal Columbia River Transmission System (FCRTS) in the history of Bonneville. This is in large part due to thousands of megawatts of renewable generators interconnecting to the FCRTS and purchasing transmission and ancillary services from Bonneville.

On the generation side, Bonneville has enhanced our positioning of the Federal Columbia River Power System (FCRPS) to significantly increase its capability to make available the flexible, clean hydropower generation for more granular dispatches to support the variability of VERs. This has resulted in Bonneville selling generation integration services to VERs that help to reliably transmit their variable generation output to loads. However, revenue from generation integration services is now declining as VERs exit the Bonneville balancing authority area in search of lower cost services from non-Bonneville sources.[6]

[6] PacifiCorp, Portland General Electric, Puget Sound Energy, and Avangrid have each electrically removed their variable energy resources from Bonneville's balancing authority area and added them into their own balancing authority areas, thus reducing the amount that they pay to Bonneville for integration services, while continuing to pay Bonneville for transmission service.

BPA-2020-00784-F 0008

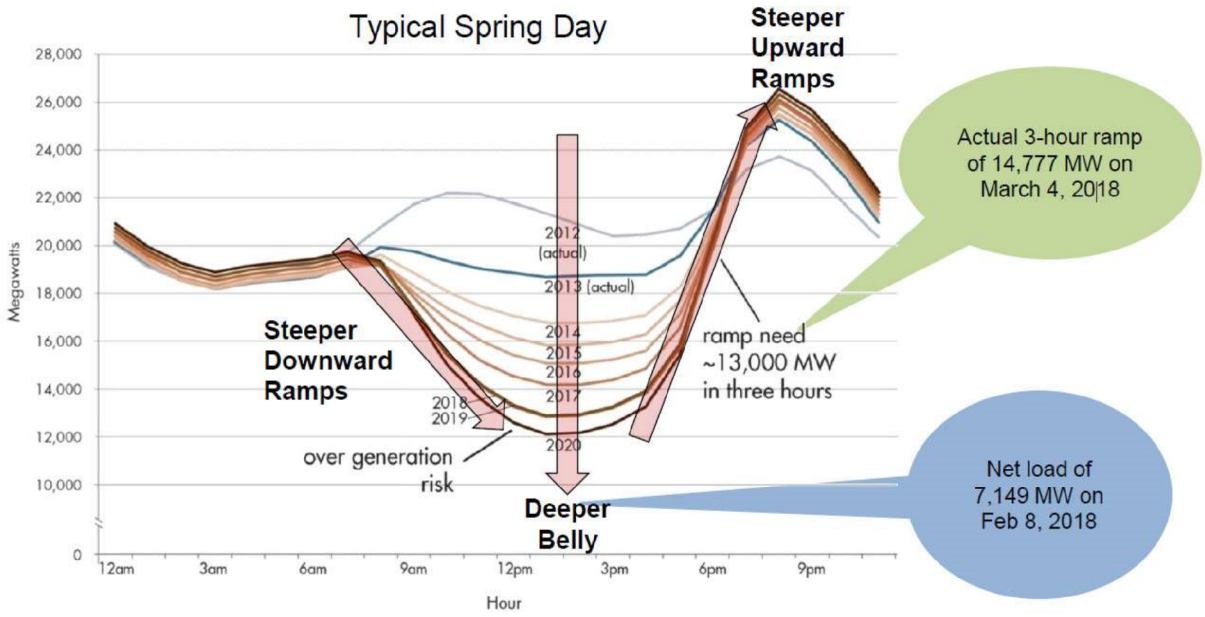


The above graphic illustrates how wind resources in particular were rapidly interconnecting into the Bonneville balancing authority area until 2012 and then subsequently exited in large numbers in 2017 and 2018. While those resources continue to take transmission service from Bonneville, they are now choosing to leave the Bonneville balancing authority area for other opportunities, including the possibility of participating in markets like the EIM.

Bonneville often has more energy supply than it needs to meet preference customer load. Therefore, in most years, Bonneville is a net seller of electricity into bilateral markets. But these markets are now experiencing abundant supplies of VERs generation and generation from low-priced natural gas. As a result, the revenues that Bonneville receives from its surplus sales have been declining. These dynamics—reduced capacity and energy revenues—have exerted upward pressure on Bonneville's power rates, affecting Bonneville's competitiveness in the region.

The CAISO's Response to the Changing Energy Landscape

Similarly, California has experienced significant expansion in VERs, pressure not to build long-line transmission, and low natural gas prices. Arguably, the CAISO's experience with some of these trends is even more pronounced than any other portion of the West.



Since 2012, the CAISO has published this "duck curve."[7] This graphic illustrates how significantly and quickly the expansion of output from VERs, particularly solar, has altered the traditional diurnal nature of its daily load curve. Now the CAISO's net load curve—load minus VER output—is oversupplied in the mid-day hours. These were traditionally the high load hours, and were therefore highly valued on-peak hours for energy sales. This "duck curve" also displays very pronounced morning and evening ramps in the spring that push the CAISO market and its operators to incent more flexible generators to be available in these hours to stabilize the grid as the sun rises and sets. Not only do marginal clearing prices for energy in organized markets like the CAISO contribute to solving this, but the CAISO has also pioneered its real-time Flexible Ramping Product in 2016. This product further compensates generators in its real-time market for the opportunity cost of producing—or not producing—energy in a current market interval so that the same generator can be available to ramp up or down when its ramp capability is needed in a future interval.[8] In other words, Participating Resources[9] are compensated for pre-positioning to generate when needed most.

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[7] Energy Storage and Distributed Energy Resource Phase 4 Issue Paper, CAISO Stakeholder Workshop, CAISO, at 38 (Mar. 18, 2019), *available at* http://www.caiso.com/Documents/Presentation-Energy-Storage-DistributedEnergyResourcesPhase4-Mar18-2019.pdf.

[8] Market Notice: Flexible Ramping Product Deployed and Activated, CAISO (Nov. 1, 2016), *available at* http://www.caiso.com/Documents/FRP-RSI_CPM_CCE2Deployed-Activated.html.

[9] *See* CAISO Tariff § 29.4(d), *available at* http://www.caiso.com/Documents/ConformedTariff-asof-Apr1-2019.pdf. Participating Resources in the EIM must sign a Participating Resource Agreement with the CAISO, submit hourly bids and base schedules to the CAISO, and settle directly with the CAISO.

BPA-2020-00784-F 0008

This chart also shows that additional flexible resources will be necessary to address these morning and evening ramps. To this end, the CAISO's efforts to develop a day-ahead product(s) that incents the commitment to pre-position additional flexible capability from resources in the day-ahead timeframe that can be deployed in real-time will help address these ramping challenges. This product(s) would be an opportunity for Bonneville and other Northwest hydro, as well as other dispatchable resources that can quickly ramp up or down, to make up for unscheduled changes in load and generation.

Similar to Bonneville, the CAISO has not approved any new long-line transmission recently.[10] This contributes to increasing amounts and duration of transmission congestion inside the CAISO market that can cause locational prices to decrease in some areas and rise in other areas of the CAISO balancing authority area.[11]

California has also experienced low natural gas prices since 2014.[12] This has contributed to low market clearing prices in many intervals, which cause existing and prospective owners of traditional dispatchable resources to not earn enough revenue to recover their capital costs.[13]

The EIM extends the CAISO's access to participating generators outside of its balancing authority area to help it to more efficiently manage the oversupply and daily ramps created by VERs. The CAISO has avoided 810,116 megawatt hours of renewable curtailments

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[10] The 2018-2019 ISO Transmission Plan provided an update on the ongoing transmission projects that were previously approved by the CAISO Board of Governors, as well as approvals for new projects this year. There were no new long line 500kV transmission project approvals greater than 60 miles in length and approximating the $750 million cost of Bonneville's project formerly known as the I-5 Corridor Reinforcement Project. Among previously approved projects costing $50 million or more (see Table 8.1-2) in the 2018-2019 Transmission Plan), there are only two transmission projects that Bonneville might consider to be similarly capital intensive "long line" projects. These are the approximately 60-mile Harry Allen (a substation owned by NV Energy) to Eldorado (a substation owned by Southern California Edison (SCE)) 500kV transmission line project approved in 2014 that is expected to be in-service in 2020 and the 114 mile Delaney (a substation owned by Arizona Public Service) to Colorado River (a substation owned by SCE) 500kV transmission line project that was also approved in 2014 with an expected in-service date in 2021. 2018-2019 Transmission Plan, California Independent System Operator, Mar. 29, 2019, at 469-82, *available at* http://www.caiso.com/Documents/ISO_BoardApproved-2018-2019_Transmission_Plan.pdf; 2013-2014 ISO Transmission Plan, CAISO, at 277-95 (July 16, 2014), *available at* http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan_July162014.pdf; 2013-2014 ISO Transmission Plan, ISO 2013-2014 Transmission Planning Process Supplemental Assessment: Harry Allen-Eldorado 500 kV Transmission Project Economic Need, CAISO, at 2 (Dec. 15, 2014), *available at* http://www.caiso.com/Documents/HarryAllen-EldoradoProjectAnalysisReport_AppendixA.pdf.

[11] *See* 2018 Annual Report on Market Issues and Performance, CAISO DMM, at 11 (May 2019), *available at* http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf.

[12] *See id.* at 3-4.

[13] *See id.* at 15-17.

BPA-2020-00784-F 0008

because of the EIM.[14] The amount and shape of EIM energy transactions has also deflected some of the pressure from transmission congestion and thermal resource retirements in California, while providing operational enhancements and spreading more than $736 million of gross benefits among all EIM participants.[15]

1.3 Description of the EIM

In assessing whether Bonneville should join the EIM, it is important to understand the mechanics of how the EIM operates.

Overview

The EIM[16] is an intra-hour (or real-time) centralized energy market used to economically dispatch participating generation resources to balance supply, transfers between balancing authority areas (interchange), and load across the market's footprint. It does so while simultaneously ensuring generation and transmission limitations are respected. For balancing authorities in the EIM (EIM Entities), the EIM replaces the provision of imbalance under sections 4 (energy imbalance) and 9 (generator imbalance) provided under the EIM Entities' respective Open Access Transmission Tariffs (Tariff). In joining the market, EIM Entities revise the imbalance service provisions of their respective Tariffs.

The EIM utilizes bids from voluntarily offered Participating Resources to come up with the most economical and reliable dispatch of generation to meet load and interchange demands. One of the primary benefits of the EIM is that it leverages the geographical diversity of resources and loads across the entire EIM footprint, which is much larger and more diverse than any single balancing authority area.

The EIM is comprised of a 15-minute market (FMM) and a 5-minute real time dispatch (RTD). This means the market clears every 15 minutes for the FMM (four intervals each hour) and every 5 minutes for the RTD (12 intervals each hour).

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[14] Western EIM Benefits Report, First Quarter 2019, CAISO, at 15 (Apr. 29, 2019), *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx. "If not for energy transfers facilitated by the EIM, some VERs located within the ISO would have been curtailed via either economic or exceptional dispatch. The total avoided renewable curtailment volume in MWh for Q1 2019 was calculated to be 8,216 MWh (January) + 6,243 MWh (February) + 37,795 MWh (March) = 52,254 MWh total." *Id.* at 14.

[15] *Id.* at 3.

[16] For more detailed information on the EIM, please see Bonneville's "EIM 101" presentation, dated September 13, 2018, *available at* https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20180913-September-13-2018-EIM-101-Workshop.pdf, or viewed by video at https://www.youtube.com/watch?v=ChYJRXEIADk.

BPA-2020-00784-F 0008

EIM-Related Agreements and Relationships

When a balancing authority area joins the EIM, it becomes an EIM Entity. Prior to becoming an EIM Entity, the balancing authority must sign an Implementation Agreement that commits the balancing authority and the CAISO to work together on implementing the necessary systems and processes so that the CAISO can operate the EIM in the balancing authority area.[17] An Implementation Agreement terminates once EIM transactions in the EIM Entity's balancing authority area become financially binding.

Before beginning financial transactions in the EIM, the balancing authority and the CAISO will sign an EIM Entity Agreement, which is an enabling agreement that allows the CAISO to operate the EIM in the balancing authority area. The EIM Entity Agreement requires an EIM Entity to abide by the terms and conditions of the CAISO's Tariff applicable to the EIM.

Generation resources in an EIM Entity's balancing authority area can be either a Participating Resource or a Non-participating Resource. A Participating Resource elects to voluntarily participate (or bid) into the EIM. In order to become a Participating Resource, the entity marketing the output of the resource must sign a Participating Resource agreement with the CAISO, which is an enabling agreement that requires the marketer of the Participating Resource to abide by the terms and conditions of the CAISO's Tariff applicable to the EIM. A Non-participating Resource is a resource within the EIM Entity balancing authority area that elects not to participate in the EIM and does not have a direct relationship with the CAISO.

EIM Entities and marketers of Participating Resources must designate a Scheduling Coordinator to submit EIM schedules to the CAISO and receive settlement invoices from the CAISO. The roles and responsibilities of each type of coordinator are memorialized in an EIM Entity Scheduling Coordinator agreement or Participating Resource Scheduling Coordinator agreement.[18] The CAISO does not settle directly with Non-participating Resources or individual load serving entities within an EIM Entity's balancing authority area.

Resource Participation

Resource participation in the EIM is voluntary both in terms of whether to become a Participating Resource and whether to participate in any given hour. Moreover, as

[17] See section 4 for a detailed discussion on the specifics of Bonneville's Implementation Agreement.
[18] For more information on the various agreements the CAISO requires and the process for joining the EIM, please see slides 11-18 of the November 14, 2018, public EIM stakeholder presentation at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181113-Nov-14-2018-EIM-Stakeholder-Mtg.pdf.

BPA-2020-00784-F 0008

described in further detail below, marketers of multiple Participating Resources can choose to aggregate resources when certain parameters are met, or even choose to designate certain portions of aggregated resources as participating and non-participating.[19] Participating Resources submit incremental and/or decremental bid ranges with specified price curves to the CAISO for every hour, and the CAISO will provide dispatch instructions to the Participating Resource's Scheduling Coordinator if the market run determines that the Participating Resource should move within the parameters of the bid range.[20]

Transmission

The EIM utilizes transmission made available to facilitate the dynamic transfers of energy between EIM Entities' balancing authority areas that may result from the market optimization. The CAISO honors physical transmission constraints within each EIM Entity's balancing authority area while running the market. The lack of transmission for EIM transfers may result in a less economical dispatch and higher prices for energy.

Transmission is provided in the EIM consistent with non-discriminatory open access principles. Currently, there is no explicit charge for transmission usage in the EIM. EIM Entities provide or allow transmission for EIM transfers in one of two ways. First, an EIM Entity can directly provide unused transmission for EIM transfers at no charge. Second, an EIM Entity may allow transmission customers to donate their transmission rights and allow that transmission to be used for EIM transfers.[21]

Market Operation & Timelines

For the EIM to operate smoothly, it has a series of hourly timelines that the EIM Entity, Participating Resources, and the CAISO must follow.[22] In general terms, the timeframes dictate when EIM Entities and Participating Resources must submit initial and revised base schedules and bid curves for Participating Resources, which the CAISO will use in its market dispatches and settlement statements. The hourly timeframes also dictate when the CAISO must run and publish the results of its resource sufficiency evaluation to ensure that EIM Entities make available sufficient resources, transmission, and flexible capacity in their respective balancing authority areas to be allowed to participate in the EIM and not

[19] *See* section 3.5.1 for more information on how Bonneville will aggregate federal resources for participation in the EIM.
[20] Section 3.5.1 describes how Bonneville will participate with federal resources in the EIM. Non-federal resource participation is discussed in section 5.5.
[21] *See* section 3.5.2 for more information on Bonneville's proposal regarding transmission donation.
[22] Bonneville conducted an "EIM 101" presentation for stakeholders on September 13, 2018, where the EIM market timelines were discussed in detail. The presentation and video can be accessed at the links provided in footnote 16, above.

BPA-2020-00784-F 0008

lean on resources in other balancing authority areas. The timelines also dictate when the CAISO must issue dispatch instructions and orders to the 15-minute and 5-minute real-time dispatch markets.

The CAISO uses the base schedules and bid range provided by EIM Entities and Participating Resources to calculate the most economic dispatch based on available transmission, transmission congestion, and losses. This dispatch results in Locational Marginal Prices (LMPs) and Dispatch Operating Targets (DOTs) for Participating Resources, occurring every 15 and 5 minutes. The CAISO also updates dynamic schedules to facilitate the optimal transfers of energy between EIM Entities.

Base schedules submitted by EIM Entities and Participating Resources become financially binding within the hour, and the CAISO uses them to generate settlements statements. Separate settlement statements are issued to the EIM Entity Scheduling Coordinator and Participating Resource Scheduling Coordinator.

EIM Settlements

The EIM is financially settled through a settlement system administered by the CAISO. Each week, the CAISO issues settlement statements to the Scheduling Coordinators for EIM Entities and Participating Resources containing their respective shares of the costs or payments associated with the EIM. The CAISO's settlement system allocates costs and payments to EIM Entities and Participating Resources in accordance with a series of charge codes that are described in detail in the CAISO's Tariff, Business Practice Manuals, and Configuration Guidelines.

While the CAISO issues settlement statements to the Scheduling Coordinators for EIM Entities and Participating Resources, it does not dictate how EIM Entities sub-allocate the benefits and costs of EIM participation to their customers. Rather, EIM Entities are responsible for developing the appropriate Tariff provisions and business practices describing and implementing the sub-allocation of EIM-related benefits and costs.[23]

EIM Governance

The EIM is governed by two decisional bodies: the CAISO Board of Governors and the EIM Governing Body.[24] The scope of each body's authority depends on whether the matter is

[23] See section 5.2 below for Bonneville's process for developing policies regarding the sub-allocation of EIM-related benefits and costs.

[24] Bonneville presented an overview of the EIM governance structure in a stakeholder meeting, dated October 11, 2018. The presentation can be accessed at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181011-October-11-2018-EIM-Stakeholder-Mtg.pdf.

BPA-2020-00784-F 0008

EIM-specific or broadly applicable to all CAISO market participants. The members of the CAISO Board of Governors are appointed by the Governor of California and meet the independence criteria for organized markets promulgated by FERC.[25] The EIM Governing Body consists of five members that act independently of market participants and stakeholders.[26]

In particular, the EIM Governing Body has authority to approve all issues that fall entirely within its "primary" authority, *i.e.*, EIM-specific rules that apply uniquely to EIM balancing authority areas.[27] Such decisions are then added to the consent agenda of the CAISO Board of Governors, meaning the EIM Governing Body's decision is deemed approved unless the CAISO Board of Governors takes an affirmative action to disapprove of the decision. The CAISO Board of Governors cannot modify Tariff provisions that are within the primary authority of the EIM Governing Body unless the EIM Governing Body first approves the Tariff modification.[28] The CAISO Board of Governors considers all other EIM matters—those not within the EIM Governing Body's primary authority—on a non-consent agenda basis. The EIM Governing Body can act in an advisory capacity to the CAISO Board of Governors on all such matters. Finally, any substantive changes to the EIM Charter must first be presented to the EIM Governing Body for advisory input and then approved by the CAISO Board of Governors.[29]

The EIM Charter establishes two additional bodies to inform EIM Governing Body decision-making: the Body of State Regulators (BOSR) and the Regional Issues Forum (RIF). The BOSR is a self-governing advisory body comprised of one utility commissioner from each state within the EIM footprint. The BOSR operates as a vehicle for states to identify and convey potential concerns related to EIM impacts on state policies and the retail customers of regulated utilities within their jurisdiction. Publicly owned utilities have no direct representation on the currently constituted BOSR because publicly owned utilities generally fall outside the jurisdiction of a state's public utility commission. The RIF is a forum for stakeholders from various sectors to discuss broad issues related to EIM

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[25] *See Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities*: *Recovery of Stranded Costs by Public Utilities and Transmitting Utilities,* Order No. 888, 75 FERC ¶ 61,080, at 280 (1996), 61 Fed. Reg. 21,540 (May 10, 1996), FERC Stats. & Regs. ¶ 31,036 (1996) (explaining that a market operator's independence with respect to governance and with respect to financial interests is fundamental to a functional and competitive market).

[26] Charter for Energy Imbalance Market Governance, CAISO, § 1.1 (rev. Mar. 27, 2019) (EIM Charter), *available at* https://www.westerneim.com/Documents/CharterforEnergyImbalanceMarketGovernance.pdf.

[27] *See also* Guidance for Handling Policy Initiatives within the Decisional Authority or Advisory Role of the EIM Governing Body, CAISO (rev. Mar. 27, 2019), *available at* https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf.

[28] EIM Charter § 2.2.

[29] *Id.* at § 8.

BPA-2020-00784-F 0008

participation and market design.[30] However, the RIF cannot consider EIM issues that are within an ongoing CAISO policy initiative. The EIM Charter allots each stakeholder sector two liaisons to represent its interests on the RIF.[31] Bonneville is an active participant on the RIF and currently holds one of the two Neighboring Balancing Authority sector liaison seats.

As required by the EIM Charter, there is currently a stakeholder process underway to review the EIM governance structure.[32] In response to stakeholder feedback, the EIM Governing Body commenced its evaluation of EIM governance in December 2018 by releasing a governance review straw proposal for public comment.[33] On September 18, the Board of Governors announced the members of a stakeholder-comprised governance review committee to develop a governance proposal(s) through an iterative public process. Bonneville actively participated in the nomination process, and was pleased to see Suzanne Cooper, Bonneville's Vice President of Bulk Marketing, appointed as a committee member. In this role, Ms. Cooper will help shape the governance structure proposal(s) that will be presented to the EIM Governing Body and Board of Governors for review and approval.

1.4 Why Bonneville Is Considering Joining the EIM

As described in section 1.2, the energy industry in the West is changing rapidly. Although initially developed as a market between the CAISO and PacifiCorp in 2014, the EIM has quickly expanded and now includes participants in two countries and nearly the entire Western Interconnection. Participating entities include, or will include, both private (investor-owned) and public utilities. Many of the EIM Entities now utilizing the EIM to help balance loads and generation in their balancing authority areas are bilateral trading partners with Bonneville.

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[30] *Id.* at § 6.
[31] *Id.* at § 6.2.
[32] *Id.* at § 2.2.4.
[33] *See* EIM Governance Review: Issue Paper and Straw Proposal, CAISO (Dec. 14, 2018), *available at* https://www.westerneim.com/Documents/IssuePaperandStrawProposal-EIMGovernanceReview.pdf.

BPA-2020-00784-F 0008


Western Interconnect Balancing Authority Areas: Energy Imbalance Market
Market Operator
California Independent System Operator
EIM Entity
Active Participant
Planned EIM Entry 2020
Planned EIM Entry 2021
Planned EIM Entry 2022
Bonneville Power Administration
BC Hydro/Powerex
Seattle City Light
Puget Sound Energy
Tacoma Public Utilities
Avista
Bonneville Power Administration
NorthWestern Energy
PacifiCorp
PGE
PacifiCorp
Bonneville Power Administration
PacifiCorp
Idaho Power Co
PacifiCorp
BANC
Nevada Energy
PacifiCorp
Turlock Irrigation District
California Independent System Operator
LA Dept. of Water & Power
Arizona Public Service Co
Public Service Co. of New Mexico
Salt River Project
Tucson Electric Power Co.
Bonneville
0 50 100 150 200 Miles
BA Source: Ventyx, 2013.
Boundaries approximate, not all utilities shown on map.

In light of this rapid industry change, Bonneville must be ever diligent in exploring ways to maximize the value of the federal power and transmission systems. This means looking for additional marketing opportunities and improving the operations of the federal power and transmission systems.

Over the last two decades, Bonneville has participated in multiple attempts to form an organized market in the Northwest. For a number of reasons, these attempts have failed and the fundamental market for the region continues to be bilateral trades. The EIM is unlike those past attempts because it is simply an extension of an existing real-time market. Other market creation efforts attempted to form a Northwest regional transmission organization with full day-ahead markets or other features formed from the ground up, and while regional parties could agree on high level concepts there were always problems solving the details of new market creation.

The EIM, on the other hand, is limited to a real-time market, and all the detailed features have been vetted through multiple stakeholder processes and approved by FERC. Rather than having to build regional consensus around the development of a new market, Bonneville only needs to determine if the EIM in its existing form will work for Bonneville and its customers.

Bonneville has been involved with the creation of the EIM since its early stages. In 2014, the CAISO and PacifiCorp formed the EIM by extending the CAISO's real-time market to PacifiCorp's balancing authority areas. Bonneville had a role because PacifiCorp's western balancing authority area is intertwined with the federal transmission system, and PacifiCorp needed to use its transmission rights on Bonneville's system to make the EIM work.

Bonneville holds transmission contracts with PacifiCorp to serve several Bonneville preference customers, and service under these contracts was affected by the creation of the EIM. Bonneville worked collaboratively with PacifiCorp and the CAISO to accommodate EIM transfers on the federal transmission system and to preserve the rights of our preference customers within PacifiCorp's balancing authority area.

Subsequently, Bonneville has worked with the other Northwest utilities that have joined the EIM. Bonneville's role has been to accommodate their use of the Bonneville transmission system while ensuring that the EIM does not impact reliability or any other uses of the system.

In addition, Bonneville has worked closely with the CAISO to develop the Coordinated Transmission Agreement, which established the parameters for how the CAISO will operate the EIM to ensure the continued reliability of the Bonneville transmission system, and

BPA-2020-00784-F 0008

provided for data sharing requirements that improved visibility of the impacts of the EIM on the Bonneville transmission system. Through all these efforts Bonneville has gained a detailed understanding of how the EIM operates, and Bonneville has taken a specific interest in the EIM rules, governance, and stakeholder processes.

Bonneville's Strategic Plan

Bonneville's Strategic Plan outlines the actions the agency will take "to leverage and enable industry change through modernized assets and system operations, and to deliver on our public responsibilities through a commercially successful business."[34] It outlines four strategic goals for the 2018-2023 timeframe:

1. Strengthen financial health.
2. Modernize assets and system operations.
3. Provide competitive power products and services.
4. Meet transmission customer needs efficiently and responsively.[35]

Bonneville's participation in the EIM would be consistent with these strategic goals, and it would leverage industry change that is already happening. Many other entities have joined the EIM, VERs generation output is increasing, and with the help of the EIM system operators are squeezing greater efficiencies from existing transmission and generation assets. Signing the Implementation Agreement is a first step that allows Bonneville to work with the CAISO to develop Bonneville's potential participation in the EIM into a strategic tool that helps ensure Bonneville can more efficiently and effectively meet its obligations while continuing to navigate this period of heightened change in the industry.

Joining the EIM is consistent with Bonneville's goals of increasing its market opportunities and improving the operation of the federal power and transmission systems. As discussed further below, Bonneville's cost-benefit analysis indicates that Bonneville's participation with federal generation resources in the EIM could result in approximately $29-34 million of additional revenue annually for Bonneville. While Bonneville is moving forward toward joining the EIM and pursuing these revenue opportunities through bidding federal resources into the EIM, Bonneville will also continue to pursue other opportunities with bilateral transactions and other markets.

Participation in the EIM would also provide Bonneville with valuable new tools to address transmission congestion. Given the diversity of loads and resources now located in the EIM

[34] Bonneville 2018-2023 Strategic Plan at 3 (Jan. 2018), *available at* https://www.bpa.gov/StrategicPlan/StrategicPlan/2018-Strategic-Plan.pdf.
[35] *Id.* at 9.

BPA-2020-00784-F 0008

footprint, Bonneville could leverage the EIM to help address constrained paths in its balancing authority area. Bonneville is well positioned to facilitate solutions to manage the growing congestion in California because of its role as operator of the principal transmission lines connecting the Pacific Northwest with Northern and Southern California, the California-Oregon Intertie and the Pacific DC Intertie respectively. In addition, Bonneville's merchant has a portfolio of firm rights on these paths that it could use for beneficial commercial solutions.

Another benefit to Bonneville becoming an EIM Entity is that it would gain access to additional data and information that would enhance system operations through greater visibility and situational awareness. In 2018, Bonneville initiated a comprehensive "Grid Modernization" project in an effort to update and modernize its systems and processes. This effort is necessary for Bonneville to remain competitive and operate as efficiently as possible. As an EIM Entity, Bonneville would gain access to certain operational tools that would add greater discipline and help operate its balancing authority area more efficiently.

Consistent with its Strategic Plan, Bonneville is also considering other opportunities to market flexible carbon-free federal power. One such opportunity is the CAISO's effort to develop a day-ahead product that incents the commitment of additional flexible capability from resources that can be deployed in real-time. Such a product would provide an opportunity for Northwest hydro and other dispatchable resources that can quickly ramp up or down to make up for unscheduled changes in load and generation. These valuable capabilities will support the reliability of the Western transmission grid as we work to integrate large amounts of additional renewable energy generation. Bonneville has taken an active role in the CAISO's ongoing effort to develop a day-ahead flexible ramping product. Bonneville expects that the CAISO will complete its stakeholder process and implement this product before Bonneville goes live in the EIM.

Issue 1.4.1

Whether Bonneville's participation in the EIM is expected to be beneficial to the agency and the region, and consistent with prevailing energy policy in the region.

Parties' Positions

Several comments supported Bonneville joining the EIM because of the financial, carbon reduction, and renewable development benefits associated with joining the market. Washington Governor Inslee, Public Generating Pool (PGP), The American Wind Energy

BPA-2020-00784-F 0008

Association (AWEA), and the Northwest Energy Coalition (NWEC) were all generally aligned and supportive of Bonneville joining the EIM.[36]

NWEC commented that joining the EIM would allow Bonneville to take advantage of the increasing value of federal hydropower.[37] Governor Inslee likewise stated that joining the EIM would increase Bonneville's revenue opportunities.[38] AWEA also pointed out that the EIM has grown rapidly in recent years, proving that it has delivered the expected benefits.[39]

In addition to financial benefits, commenters highlighted the efficiency and carbon reduction benefits associated with the EIM. According to AWEA, joining the EIM would give western states more access to some of the highest quality wind in the country to efficiently and cost-effectively achieve renewable portfolio standards and clean energy goals.[40] NWEC commented that the EIM would provide several benefits to Northwest electricity customers as a whole, including increased reliability, reduced costs, cleaner energy, and pollution and greenhouse gas reduction.[41] As a result, Bonneville's participation would help states achieve clean energy and climate goals.[42] Governor Inslee agreed that joining would enable Bonneville to be a regional economic driver in reducing carbon emissions, which would support Washington's implementation of its 100 percent clean electricity policy.[43] Chair Decker and Director Benner, of the Oregon Public Utilities Commission (OPUC) and Oregon Department of Energy (DOE) respectively, also agreed that the EIM has the potential to increase the dispatch of renewable energy and thereby reduce greenhouse gas emission, which could help Oregon meet its climate goals.[44] Overall, commenters were enthusiastic about the many benefits associated with Bonneville joining the EIM.

One commenter, though generally supportive, expressed frustration that Bonneville has not joined the EIM sooner. Mr. David Galle wrote that it was "frustrating . . . to see Bonneville sitting on the sidelines as other entities . . . enjoyed a cumulative $650 million of benefits to date due to their EIM participation."[45] He explained that "EIM lite" concepts, attempted by other Northwest entities, were not realistic or competitive with the CAISO

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[36] Governor Inslee Comments at 2; PGP Comments at 1; AWEC Comments at 1; NWEC Comments at 1.
[37] NWEC Comments at 3.
[38] *Id.* at 1.
[39] AWEA Comments at 1.
[40] *Id.*
[41] NWEC Comments at 1.
[42] *Id.*
[43] Governor Inslee Comments at 1.
[44] OPUC/ODOE Comments at 1.
[45] Galle Comments at 1.

BPA-2020-00784-F 0008

EIM, and competiveness is an issue for Bonneville. [46] In closing, he reiterated that Bonneville has already delayed long enough, and that the agency's viability and relevancy as a competitive Northwest energy marketer depends on a successful integration with the CAISO EIM as soon as practicable.[47]

Evaluation of Positions

Bonneville agrees with these supportive commenters that joining the EIM will likely result in financial and transmission benefits, as well as carbon reduction and improved renewable integration. In addition, Bonneville appreciates the input and enthusiastic support from the states of Oregon and Washington.[48]

Bonneville agrees with AWEA Comments that "the Western EIM has been growing rapidly" and that existing EIM participants also continue to realize benefits.[49] Similarly, the OPUC notes that "the Commission has been encouraged by the cost-saving efficiencies the EIM has provided utility customers," and they specifically reference gross benefits from EIM participation received by PacifiCorp, Portland General Electric (PGE), and Idaho Power.[50] Indeed, the latest quarterly EIM benefits report covering the second quarter of 2019 was released on July 31, 2019. Gross EIM benefits have grown to $736 million since the EIM began and grew by a total of $86 million in the quarter spread among the now nine participants since BANC went live on April 3, 2019.[51] This further demonstrates the continued growth and the continued benefits accruing from EIM participation.

The Eugene Water and Electric Board (EWEB) notes the importance of Bonneville developing requirements to provide the owners/operators of non-federal resources within the Bonneville balancing authority area the opportunity to act as Participating Resources with the EIM.[52] In addition, some of Bonneville's largest power customers have already made plans to become EIM Entities themselves.[53] In doing so, each of those customers who pursue their own EIM participation could expect financial and other benefits to accrue to them as well, spurring additional financial, operational, renewable, and carbon reduction benefits in the region.

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[46] *Id.*
[47] *Id.* at 2.
[48] Governor Inslee Comments at 1; OPUC/ODOE Comments at 1.
[49] AWEA Comments at 1.
[50] OPUC/ODOE Comments at 1.
[51] Western EIM Benefits Report, Second Quarter 2019, CAISO, at 3-4 (July 31, 2019), *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.
[52] EWEB Comments at 2.
[53] Seattle City Light entered into its Implementation Agreement with the CAISO on December 13, 2016, and filed their EIM Entity Agreement with FERC on April 18, 2019. Tacoma Power signed an Implementation Agreement in August of 2019 and has a projected go live date of April of 2022.

BPA-2020-00784-F 0008

Part of the reason that the EIM has been growing fast is that it contributes to clean electricity policies adopted in a number of Western states. Bonneville agrees with Governor Inslee that its participation in the EIM "will support the implementation of Washington's 100 percent clean electricity policy through the integration of clean and variable energy resources and more efficient use of the transmission system."[54] Bonneville also agrees with the OPUC that "the EIM also has the potential to increase the dispatch of renewable energy and thereby reduce greenhouse gas emissions, which could help Oregon meet its climate goals."[55] The EIM has achieved greenhouse gas emissions reductions equivalent to 56,897 metric tons of CO2 through avoided curtailments of generation from zero-carbon resources, such as resources that generate electricity from the sun and wind.[56] Thus the EIM helps to facilitate the integration of variable energy resources.

And finally, the EIM allows for more efficient use of the transmission system by dispatching least-cost generating resources across a much broader footprint than Bonneville's single balancing authority to meet load within the security constraints of the transmission system.

In response to Mr. Galle's comment, Bonneville notes that it has been actively involved with the EIM since its inception. Transmission customers of Bonneville comprise 7 out of the 8 current EIM Entities. Power customers of Bonneville are also present in 5 of the 8 current EIM Entities participating in the EIM, including PacifiCorp, which was the initial EIM Entity in November 2014. Bonneville also negotiated the Coordinated Transmission Agreement with the CAISO to memorialize the EIM's use of Bonneville's transmission system and help to protect and enhance the reliability of the Federal Columbia River Transmission System.[57] Bonneville has also been working diligently with the CAISO for the past year to arrive at mutually agreeable terms for the Implementation Agreement. By joining the EIM, Bonneville will capture the financial, carbon reduction, and renewable integration benefits beginning with our planned go-live in March 2022.[58]

Decision

Bonneville expects its participation in the EIM will be beneficial to the agency and the region because of its positive effects on revenue potential for the agency and its customers, as well as its positive effects on carbon reduction and renewable energy production goals in the region. This is consistent with Bonneville's strategic goals and prevailing energy policy in the region.

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[54] Governor Inslee Comments at 1.
[55] OPUC/ODOE Comments at 1.
[56] Western EIM Benefits Report, Second Quarter 2019, CAISO, at 3.
[57] *See* section 6.
[58] Galle Comments at 2.

BPA-2020-00784-F 0008

Issue 1.4.2

Whether Bonneville's competitiveness and position in the marketplace are expected to improve by linking EIM with Bonneville's continuing pursuit of its comprehensive grid modernization initiative.

Parties' Positions

Governor Inslee specifically highlighted the link between grid modernization, EIM participation, and Bonneville's competitiveness, stating: "I strongly support BPA's participation in this innovative, efficient, organized regional energy market, and BPA's grid modernization initiative."[59] Renewable Northwest also identified Bonneville's EIM participation "as a means to modernize assets and system operations."[60]

NWEC stressed that an important aspect of EIM participation was the necessity of upgrading communications and control within the power and transmission system.[61] NWEC recognized that the needed upgrades for metering would take considerable time and effort for systems as complex as federal hydropower and transmission systems. As a result, they strongly supported any grid modernization initiatives tied to Bonneville's EIM participation.[62]

Tacoma Power (Tacoma) also acknowledged that Bonneville's decision is not only to sign the Implementation Agreement with the CAISO, but also "to begin investing in infrastructure to potentially join the EIM in early 2022."[63] Importantly, these infrastructure investments are made as parts of projects that comprise Bonneville's comprehensive grid modernization initiative.

Evaluation of Positions

Bonneville agrees that its participation in the EIM is important for the agency's grid modernization initiative and vice versa. The two initiatives are linked and are being managed jointly through the Business Transformation Office for the benefit of the agency and its customers.

Bonneville's continued investment in and implementation of its comprehensive grid modernization initiative are critical for Bonneville's participation in the EIM. Several of the

[59] Governor Inslee Comments at 1-2.
[60] Renewable Northwest Comments at 1.
[61] NWEC Comments at 1.
[62] *Id.*
[63] Tacoma Comments at 1.

BPA-2020-00784-F 0008

projects on the Grid Modernization Roadmap are specifically tied to Bonneville's EIM implementation.[64]

As noted by NWEC, Bonneville agrees it is important to upgrade "communications and control within the power and transmission system,"[65] and Bonneville's Grid Modernization Roadmap has a number of projects addressing this concern.

As Governor Inslee points out, jointly pursuing the EIM and grid modernization are important for Bonneville's competitiveness.[66] Joining the EIM will assist Bonneville in its grid modernization efforts and support Bonneville's continued competitiveness. As discussed throughout this Record of Decision, Bonneville will recognize financial, carbon reduction, renewable integration, and transmission benefits associated with joining the EIM.

Decision

Bonneville's competitiveness and position in the marketplace are expected to improve by jointly pursuing EIM participation and continued investment in and implementation of the agency's comprehensive grid modernization initiative.

Issue 1.4.3

Whether Bonneville's interest in the CAISO's Day-Ahead Market Enhancements is an important element of Bonneville joining the EIM.

Parties' Positions

Most commenters on this issue are supportive of Bonneville paying close attention to the CAISO's ongoing efforts to develop a day-ahead flexible ramping product. At the same time, many of the commenters have additional questions and suggestions for Bonneville.

Alliance of Western Energy Consumers (AWEC) is supportive of Bonneville engaging in both the Enhanced Day-Ahead Market (EDAM) and Day-Ahead Market Enhancements

[64] Grid Modernization Roadmap, Bonneville Power Administration (July 29, 2019), *available at* https://www.bpa.gov/Projects/Initiatives/Grid-Modernization/gridmod/Current-Grid-Mod-Roadmap.pdf.
[65] NWEC Comments at 1.
[66] Governor Inslee Comments at 1.

(DAME) processes.[67] However, AWEC believes the flexible ramping products available through the DAME are inferior to the value produced by the EDAM.[68]

Seattle City Light (Seattle) is supportive as well, but notes that the ability of an EIM Entity to benefit from new products developed for the day-ahead market is premised on the market being available to EIM participants.[69] In addition, Seattle would like to understand whether Bonneville's decision to join the EIM relies on the availability of a day-ahead flexible ramping product.[70] The Public Power Council (PPC) similarly wants to know if the creation of such a product is an important consideration in Bonneville's decision to join the EIM, and if it is, why that is so.[71] Other commenters, like the Washington Public Utility Districts Association (WPUDA), believe that additional mechanisms are required to compensate Bonneville for the capacity value of the flexible, carbon-free federal power it chooses to provide.[72]

National Grid states that a day-ahead market could be part of the solution to ensure the market adequately compensates entities, like Bonneville, who provide flexible carbon-free capacity.[73] However, National Grid also feels that a day-ahead market alone does not support the development and continued investment in the quantity of flexible capacity needed to maintain reliability in a carbon constrained future.[74] Their comments suggest that any proposed solution to the region's flexible capacity needs must include a long-term capacity procurement mechanism that ensures sufficient flexible capacity to meet the needs of an integrated system.[75]

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[67] The DAME is a CAISO stakeholder process that has been underway for several months. The purpose of the DAME is to develop enhancements for the existing CAISO day-ahead market to help the CAISO with the duck curve and other issues arising from the significant increase in renewables. One of the primary benefits of the DAME is a day-ahead product that better values the benefits of flexible generation resources, *e.g.*, a flexible ramping product (FRP). Depending on how the FRP is designed, it could develop into a significant source of much needed capacity for the CAISO and become a valuable market for available Northwest hydro capacity. The EDAM is a concept that the CAISO and existing EIM Entities have been developing recently. The EDAM would be an extension of the CAISO day-ahead market to EIM Entities balancing authority areas. In theory the EDAM would allow expansion of the day-ahead market beyond California without having to form a west-wide RTO. The EDAM is still in the conceptual phase, and there are several aspects that will need to be worked out. A benefit report on the EDAM is expected to be published in the near future.

[68] AWEC Comments at 3.

[69] Seattle Comments at 1.

[70] *Id.*

[71] PPC Comments at 9.

[72] WPUDA Comments at 4.

[73] National Grid Comments at 1-2.

[74] *Id.*

[75] *Id.* at 2.

BPA-2020-00784-F 0008

National Grid is aware that the Northwest Power Pool (NWPP) is working on an initiative to develop consistent capacity accounting rules for the region and that Bonneville is part of that effort. National Grid also points out that only members of the NWPP get to participate in this process, and that many of the members also happen to be load-serving entities "leaning" on the capacity of entities like Bonneville. As a result of these two factors, National Grid feels that there is a "notorious lack of transparency" in the NWPP, coupled with conflicting interests.[76] In conclusion, National Grid suggests that Bonneville should seek to develop a capacity accounting mechanism outside of the NWPP and specifically include all owners of capacity and developers of new capacity in the region.[77]

Evaluation of Positions

Bonneville appreciates AWEC's and others' support for the agency's efforts on DAME. It also acknowledges AWEC's characterization of the day-ahead flexible ramping product as both inferior to the value that may be produced in an EDAM and as a transitional product until further, more comprehensive modifications can be adopted. Bonneville agrees that there should be more value to flexible resources if the footprint for a day-ahead flexible ramping product grows from only the CAISO balancing authority area to the entire EIM.

Regarding Seattle's observation that "the ability of any EIM Entity to benefit from new products developed for the day-ahead market is premised on the day-ahead market being available to EIM Entities,"[78] Bonneville clarifies that the CAISO's day-ahead market is available to market participants throughout the West today, and we anticipate that the enhancements will be as well. Specifically, Bonneville supports the CAISO's most current technical proposal that the day-ahead flexible ramping product would settle in the CAISO's FMM (15-minute market) and not the RTD (5-minute market).[79] Further, Bonneville is also advocating for the CAISO's most current proposal, which indicates that the day-ahead flexible ramping product would utilize transmission (*i.e.*, a static transmission product and not a dynamic transmission product). This proposal would make the market available to bilateral market participants, in particular because the CAISO's day-ahead market produces and will continue to produce hourly energy schedules.[80] Both of these attributes of the CAISO's proposal would allow the day-ahead flexible ramping product to be available to market participants outside of the existing EIM or an eventual EDAM.

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[76] *Id.*
[77] *Id.* at 3.
[78] Seattle Comments at 1.
[79] Day-Ahead Market Enhancements, Appendix C: Draft Technical Description of IFM-FRP, CAISO, at 1-2 (June 11, 2019), *available at* https://www.caiso.com/Documents/DraftTechnicalDescription-Day-AheadMarketEnhancements-IntegratedForwardMarket-FlexibleRampingProduct.pdf.
[80] *Id.*

BPA-2020-00784-F 0008

Bonneville appreciates that customers seek to understand if and how Bonneville's decision to join the EIM is premised on the availability of a day-ahead flexible ramping product before Bonneville goes live in the EIM.[81] As indicated in the Proposal, Bonneville has taken and will continue to take an active role in the CAISO's ongoing effort to develop a day-ahead flexible ramping product.[82] Bonneville expects that the CAISO will complete its stakeholder process and implement this product before Bonneville starts operating in the EIM.

Bonneville agrees with WPUDA and National Grid that additional mechanisms are required to compensate resource owners for long-run marginal costs. The EIM compensates for energy at short-run marginal prices that typically reflect only variable costs of operation and maintenance. A day-ahead flexible ramping product would begin to close the compensation gap between short-run marginal costs and long-run marginal costs because of the capacity payment associated with the reserved transmission and generation capability in addition to the energy compensation provided if the resource is awarded all the way through to RTD (5-minute). However, this day-ahead reservation is inherently only up to one day long. Therefore, other compensation mechanisms are required to compensate resource owners for their long-run marginal costs. Without such compensation, Bonneville believes that resource owners will not be sufficiently incented to respond to clear indications of tight supply.

Bonneville agrees with National Grid's comment that "a day-ahead market alone does not support the development and continued investment in the quantity of flexible capacity needed to maintain reliability in a carbon constrained future."[83] While this is true, the day-ahead capacity market being developed by the CAISO is a necessary first step.

As to National Grid's comments regarding the NWPP developing consistent capacity accounting rules for the region, Bonneville believes that more transparency and participation by additional regional stakeholders is needed going forward, but Bonneville cannot act alone. To develop enforceable rules for the region, a coalition of interests is necessary, and this must start with the balancing authority areas that are all members of the NWPP.

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[81] Seattle Comments at 1; PPC Comments at 9.
[82] Administrator's Cover Letter, Letter to the Region, at 2-3.
[83] National Grid Comments at 1-2.

BPA-2020-00784-F 0008

Decision

The CAISO's day-ahead market enhancements are an important element of a well-functioning market. Bonneville will continue to strongly advocate in the CAISO's development of a day-ahead flexible ramping product. Bonneville will also continue to look for viable opportunities for the development of other market products that more clearly identify the needs and compensation for longer-term energy, capacity, and flexibility.

Issue 1.4.4

Whether Bonneville's consideration of participation in EDAM should happen through another stakeholder process.

Parties' Positions:

Most commenters on this issue are supportive of Bonneville's involvement in the development of an EDAM proposal. Seattle encourages Bonneville to become actively engaged in the EDAM process.[84]

Many of the commenters feel that a decision to participate in the EDAM should require a separate public process. One of those commenters, EWEB, feels such a decision would require a separate ROD because the region-wide expansion of a day-ahead product would have market impacts greater than those of the EIM.[85] PPC likewise asserts that participation in the EDAM is outside the scope of the current EIM process.[86] Northwest Requirements Utilities (NRU) and Snohomish PUD (Snohomish) also comment that Bonneville's participation in such a market would require a different public process.[87]

Evaluation of Positions

Bonneville appreciates that most commenters would support its participation in the development of an EDAM proposal. However, such support is premature given that there is scant publically available information to describe the details of the EDAM proposal.

Bonneville anticipates that the CAISO would have to develop new tariff provisions for EDAM as it did for EIM.[88] Furthermore, Bonneville also anticipates that similar contractual agreements with the CAISO would be required to establish implementation guidelines and

[84] Seattle Comments at 1.
[85] EWEB Comments at 3.
[86] PPC Comments at 9.
[87] NRU Comments at 12; Snohomish Comments at 3.
[88] Section 29 of the CAISO Tariff is dedicated obligations related to EIM.

BPA-2020-00784-F 0008

participation obligations, respectively, for an extension of the day-ahead market to EIM Entities. Bonneville agrees with PPC, NRU, Snohomish, and EWEB that Bonneville will conduct a future stakeholder process if Bonneville is seriously considering participation in EDAM.[89] Further, Bonneville agrees wholeheartedly with PPC that the "scope and duration of such a discussion/process should be determined after more is known about a potential EDAM proposal."[90]

Decision

Bonneville will consider its participation in EDAM through a separate stakeholder process and would consider a separate Record of Decision should such a decision become ripe.

[89] PPC Comments at 9-10; NRU Comments at 12; Snohomish Comments at 3; EWEB Comments at 3.
[90] PPC Comments at 9.

BPA-2020-00784-F 0008

2.0 Decision-Making Framework for EIM Participation

Overview

Signing an Implementation Agreement is a significant milestone that will involve a considerable commitment of time and resources. Bonneville has divided joining the EIM into a multi-year series of incremental decisions that culminate in a possible go-live in March of 2022. This series of decisions will determine how Bonneville will participate and how that participation will affect other parties doing business with Bonneville. This step-based decision making framework limits upfront costs and risks and outlines a clear plan for moving through the various stages required to decide on implementing, joining, and participating in the EIM.

Bonneville's series of incremental decisions are divided into five phases. Through these phases, Bonneville will decide whether and how to join the EIM, as well as navigating the required implementation steps for participation in the EIM. The five phases of Bonneville's decision process are:

1. Phase I – Exploration from July 2018 through June 2019
2. Phase II – Implementation Agreement, EIM principles, and some policy decisions from June 2019 through September 2019
3. Phase III – Additional policy decisions from October 2019 through August 2020
4. Phase IV – Rate and Tariff Proceeding from October 2020 through July 2021
5. Phase V – Close-Out Letter from October 2021 through December 2021

Each phase is described below.

Phase I – Exploration (July 2018 to June 2019)

Phase I was EIM exploration for Bonneville and its stakeholders, the time immediately preceding the Proposal during which Bonneville and stakeholders were learning about the mechanics of the EIM and exploring details and nuances related to joining and participating in the EIM. During the exploration phase, from July 2018 through June 2019, Bonneville held monthly public meetings on particular topics related to the EIM. Bonneville sought informal comment from stakeholders, and those comments were addressed verbally at subsequent public meetings or one-on-one with the commenter.

The topics discussed in the meetings during the exploration phase are the following:

1. Treatment of Transmission
2. Generation Participation Model (FCRPS)
3. EIM Governance
4. Cost-Benefit Analysis
5. Balancing Authority Area Resource Sufficiency

BPA-2020-00784-F 0008

6. EIM Settlements
7. Use of Reliability Tools such as Operational Controls for Balancing Reserves (OCBR) and Oversupply Management Protocol (OMP)
8. Load Zone
9. Market Power and Default Energy Bid (DEB)
10. Carbon Obligation in the EIM
11. Relationship of the EIM to other emerging markets

The materials presented at those meetings and comments received are posted at https://www.bpa.gov/Projects/Initiatives/EIM/Pages/Energy-Imbalance-Market.aspx. In addition to the monthly public meetings, Bonneville staff met with stakeholders who requested meetings to discuss specific issues of interest to them during the exploration phase.

Phase II –Implementation Agreement and high level issue analysis, including decisions on overarching principles for joining the EIM, and decisions on several policy and legal issues (June 2019 to October 2019)

Phase II was initiated with the publishing of the Proposal on June 20, 2019. The Proposal, stakeholder comments, and Bonneville responses contained in this Record of Decision (ROD) are the key components of Phase II. The Proposal included a proposal to sign the Implementation Agreement, a discussion of Bonneville's legal authority and business reasons for considering joining the EIM, proposed principles that Bonneville will follow throughout the remaining phases of Bonneville's EIM decision process, and proposed policy decisions on certain issues that have been covered in Bonneville's stakeholder meetings during Phase I of the process. Stakeholders commented on the contents of the Proposal, and Bonneville has published this ROD addressing those comments. The ROD contains Bonneville's decision to sign the EIM Implementation Agreement with the intent to join the EIM in 2022, and responds to comments on the other policy and implementation decisions covered in the Proposal.

In Phase II, Bonneville has moved on to development of systems and technical knowledge of the EIM to position itself to participate in the EIM. Signing the Implementation Agreement initiates a particular set of technical work by the CAISO and Bonneville to prepare for Bonneville's potential participation in the EIM, and it commits Bonneville to pay the CAISO six equal payments of $311,650, due upon the completion of six milestones, for a total payment of $1,870,000. In addition, Bonneville will initiate a series of

investments in internal systems and processes that are estimated to cost $30-35M (Start-up costs).[91]

The decisions that are being made or established in this ROD are:

1. Whether to sign the EIM Implementation Agreement,
2. Bonneville's legal authority to join the EIM,
3. Bonneville's business case for joining the EIM,
4. What Bonneville's EIM principles will be, and
5. Decisions on the following policy issues:
    a. Federal Generation Participation Model
    b. Transmission Usage—Interchange
    c. Use of Reliability Tools such as OCBR and OMP
    d. Carbon Obligations and related considerations
    e. Market Power (Local Market Power Mitigation (LMPM) and Default Energy Bid (DEB)
    f. Load Zone
    g. Resource Sufficiency—Balancing Authority Area

These decisions are final decisions, meaning stakeholders' opportunity to raise issues and concerns regarding these proposals was during the comment period to the Proposal. Upon issuance of this ROD, these decisions will not be revisited during subsequent phases of this decision process *unless* there is a significant or material change in the underlying facts or in the way the EIM operates. Although the decisions being made in this ROD will be final decisions, they will not be ripe for judicial review unless and until Bonneville makes a decision to join the EIM.

Phase III – Additional Policy Decisions (October 2019 to August 2020)

Phase III will commence immediately after Bonneville publishes this ROD and signs the Implementation Agreement. During Phase III, Bonneville will continue holding EIM stakeholder meetings to discuss the remaining important policy issues that have not been covered in this ROD as part of Phase II.

The policy issues that will be addressed in Phase III are the following:

1. Transmission Usage—Network
2. Allocation of EIM Charge Codes
3. Resource Sufficiency—Sub-Balancing Authority Area Level
4. Transmission Losses
5. Non-federal Resource Participation Requirements

[91] *See* section 3.4.

BPA-2020-00784-F 0008

6. Settlements/Billing (Mechanics)
7. Data Submission Requirements
8. Metering Requirements

If Bonneville learns of additional policy issues that need resolution, they will be added to this list.[92]

During Phase III, EIM stakeholder meetings will continue and will flow into pre-rate and pre-Tariff proceeding workshops as appropriate. Some of the policy issues may be resolvable outside of the rate and Tariff proceedings. For those issues, Bonneville will present written proposals covering the issues, take formal written comments on these proposals, and will issue decision documents addressing the comments received and setting out decisions on these policy issues. For issues that will need to be decided in the rate and Tariff proceedings, those issues will continue to be discussed in pre-rate and pre-Tariff proceeding workshops in preparation for the TC-22 and BP-22 proceedings.

Phase IV – Tariff Terms and Conditions Case and Rate Case (October 2020 to July 2021)

During Phase IV, the policy decisions made in Phases II and III will be implemented through the TC-22 Tariff Terms and Conditions proceeding and the BP-22 rate case proceeding. The TC-22 proceeding will establish EIM-related terms and conditions that will become part of Bonneville's Tariff and will apply to Bonneville's transmission customers. The BP-22 rate proceeding will establish the EIM-related rates and cost allocations that will apply to Bonneville's customers. The EIM terms and conditions, and the applicable rate changes associated with EIM participation, will not become effective until Bonneville begins participation in the market. Thus, the applicability of the EIM terms and conditions and rates will depend on Bonneville's final decision regarding joining the EIM, which will take place after the cases are completed and during the BP-22 rate period.

The BP-22 rate proceeding will be conducted pursuant to section 7(i) of the Northwest Power Act, 16 U.S.C. § 839e(i), and Bonneville's associated procedural rules, Final Rules of Procedure, 83 Fed. Reg. 39,993 (Aug. 13, 2018). The EIM-related rates that result from the BP-22 proceeding will be final decisions, reviewable pursuant to section 9(e)(1)(G) of the Northwest Power Act, 16 U.S.C. § 839f(e)(1)(G). The TC-22 proceeding is conducted in accordance with section 9 of Bonneville's Tariff, which provides the Administrator with the ability to change Tariff terms and conditions after conducting a proceeding in accordance with section 212(i)(2)(A) of the Federal Power Act (requiring the proceeding to follow

[92] These issues are described and discussed briefly in section 5.

BPA-2020-00784-F 0008

most of the processes set forth in section 7(i) of the Northwest Power Act) and issuing a final decision which considers factors set forth in Tariff section 9. The EIM-related terms and conditions adopted by the Administrator in the TC-22 proceeding will be final decisions.

Phase V – Close-Out Letter (October 2021 through December 2021)

After the conclusion of the TC-22 and BP-22 proceedings, Bonneville will make a final decision whether to join the EIM. If Bonneville decides to join the EIM, Bonneville will write a letter stating that proposed decision and setting out how that decision is consistent with Bonneville's principles for joining the EIM that were established in Phase II. Stakeholders will have an opportunity to comment on this proposed decision. Bonneville will publish a final Close-Out Letter addressing the comments and setting out its decision on joining the EIM. Bonneville's decision to join the EIM, if made, will be a final action ripe for judicial review under section 9(e) of the Northwest Power Act, 16 U.S.C. § 839f(e).

If Bonneville decides to join the EIM, Bonneville plans to begin financially binding transactions in the EIM in March 2022 (Go Live). Bonneville will sign an EIM Entity Agreement and the various other CAISO agreements necessary for joining and participating in the EIM before the Go Live date.

The above process provides a transparent roadmap for Bonneville and its stakeholders that will provide structure and opportunity for input to the multiple decisions that are required for Bonneville to join the EIM.

Issue 2.1

Whether Bonneville should adopt the proposed five-phase decision making approach to decide whether to join the EIM.

Commenters' Positions

Customers voiced support for Bonneville's proposed five-phase process for deciding whether to join the EIM.[93] Seattle notes that it "greatly appreciates the detailed timelines and description of decisions that will be made in each phase."[94] Further, many commenters

[93] NV Energy Comments at 2; Seattle Comments at 1.
[94] Seattle Comments at 2.

BPA-2020-00784-F 0008

commend Bonneville on the transparency of its stakeholder process so far and the level of engagement Bonneville has had with its customers throughout the process.[95]

Some customers offer suggestions or raise concerns with the decision process Bonneville has proposed. NWEC seeks more detail in future decision documents.[96] PPC seeks clarification on the distinction between Phases III and IV of the proposed process.[97] PPC states that "it is unclear precisely how Phases III and IV of the process interact. Our understanding is that there may be some overlap between these two phases."[98] PPC suggests that "customers and BPA should work together to determine which changes will be sought through a formal process (such as BP-22 or TC-22) and which will be made through an informal process (such as a business practice change)."[99]

Evaluation of Positions

Bonneville genuinely appreciates the comments commending the transparency of its stakeholder process so far. Bonneville plans to continue to conduct its stakeholder process for the remainder of the EIM decision-making processes with an equal level of transparency.

NWEC encourages Bonneville to include more detail in its future decision documents, as well as after the projected EIM Go-Live in 2022.[100] NWEC did not provide examples of the type of detail it thought Bonneville was lacking. However, Bonneville agrees that it is important to provide as much detail as possible, and Bonneville will strive to do this in future stakeholder processes and decision documents.

The Slice Customer Group (Slice Group) suggests Bonneville consider including the policy issues slated for Phase III with rate determinations or tariff terms and conditions workshops leading up to the TC-22 and BP-22 proceeding.[101] The Slice Group notes that because the issues slated for review in Phase III are more granular than those in Phase II, Bonneville and stakeholders may be in a better position to evaluate these policies if this

[95] NWEC Comments at 4; Seattle Comments at 2; PPC Comments at 1; EWEB Comments at 1; PGP Comments at 1, 3; Tacoma Comments at 1; M-S-R Comments at 2; WAPUDA Comments at 1, NRU Comments at 1.
[96] NWEC Comments at 4.
[97] PPC Comments at 2.
[98] *Id.*
[99] *Id.*
[100] NWEC Comments at 4.
[101] Slice Group Comments at 3-4.

BPA-2020-00784-F 0008

evaluation occurs concurrently in the rate and tariff proceedings, where the direct impacts of these policies can be assessed.[102]

Similarly, PPC notes that it is unclear how Phase III and Phase IV will interact.[103] PPC's understanding is that there may be some overlap between the phases, and encourages Bonneville to work with its stakeholders to determine which decisions will be made in formal and informal processes.[104] PPC notes that "[a]ny policies that require changes to rates or BPA's Tariff will need to be made through a formal process (BP-22 or TC-22) . . . ."[105] NRU similarly questions whether Bonneville should characterize any decisions that will be made in Phase III as final if they may affect "rate design, cost allocation, or other policy decisions."[106] Rather, NRU suggests Bonneville view Phase III as laying the groundwork for the Initial Proposal for the BP-22 and TC-22 proceedings.[107]

There is clearly an interrelationship and overlap between some of the Phase III issues and the rate and tariff proceedings. Bonneville agrees that the relationship between Phase III and IV is not definitively set out. That lack of specificity was intentional because Bonneville wanted to leave open the opportunity for customers and Bonneville to work together during Phase III to discuss the scope of Phase III. Bonneville will work with stakeholders to provide more detail on the decisions Bonneville intends to make in Phase III and the interplay of those decisions with Phase IV. In some instances, the decisions Bonneville makes in Phase III may, as NRU notes, be initial positions that will be formalized into the Initial Proposals for the BP-22 and TC-22 proceedings. Consistent with commenters' requests, early in Phase III, Bonneville intends to provide more detail on how the Phase III and Phase IV processes will interrelate.

PPC also contends that Phase V, while important to support Bonneville's Go-Live decision, should not be a final assessment of participation.[108] Instead, PPC suggests that Bonneville should continue to assess its participation on an ongoing basis to ensure that participation continues to be in the interest of Bonneville and its customers.[109]

Bonneville generally agrees with PPC's comment that Phase V is primarily geared toward preparing Bonneville for EIM participation. PPC's comments suggest that Bonneville should continue to assess whether continued participation is in the agency's interest. After

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[102] *Id.* at 4.
[103] PPC Comments at 2.
[104] *Id.*
[105] *Id.*
[106] NRU Comments at 4.
[107] *Id.*
[108] PPC Comments at 2.
[109] *Id.*

BPA-2020-00784-F 0008

joining the EIM, it is Bonneville's intent to continue to monitor the market and EIM development to ensure its interests are being protected. As the EIM is a voluntary market, Bonneville would have rights to withdraw from the EIM for any reason, including if participation would violate Bonneville statutes or would otherwise harm Bonneville's interests. To be clear, though, once Bonneville has joined the EIM, it is not Bonneville's plan to continue to run a similar public process to determine whether continued participation is appropriate. Whether factors would warrant Bonneville exercising its right to withdraw from the EIM would depend on the facts and circumstance at the time and would be considered on a case-by-case basis.

Decision

Bonneville will utilize the five-phase decision-making process to determine whether to join the EIM. Bonneville will include as much detail as possible in its future decision documents. During Phase III, Bonneville will seek input from customers before determining which policy items are appropriate for decision and which items must be decided in a rate case or tariff proceeding.

Issue 2.2

Whether Bonneville should label its conclusions that it has the legal authority and business case support to join the EIM as "preliminary" rather than "final" decisions.

Commenters' Positions

Several commenters express concerns with Bonneville's proposal to make various final decisions in this ROD regarding the agency's ability to participate in the EIM.[110] Specifically, many stakeholders contend that Bonneville should not make a final decision in this ROD on the agency's legal authority to join the EIM or on the business case supporting Bonneville's participation. Instead, these parties contend that Bonneville should wait to make these decisions until the Close-Out Letter in Phase V of the decision process.[111] Consistent with this view, several commenters also request Bonneville to clarify in this ROD that Bonneville's decisions regarding the agency's legal authority and business case are "preliminary" and will be revisited as Bonneville considers its principles prior to signing the EIM Entity Agreement in Phase V.[112]

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[110] AWEC Comments at 4; Clatskanie Comments at 1-2; NRU Comments at 4; PPC Comments at 1-5; Slice Group Comments at 4-5; Snohomish Comments at 1-2; WPAG Comments at 2-3, 5-6; PNGC Comments at 1.
[111] *Id.*
[112] PPC Comments at 2-3; Slice Group Comments at 2-3; Snohomish Comments at 2; WPAG Comments at 3.

BPA-2020-00784-F 0008

PPC suggests that Bonneville not make any final policy decisions in either this ROD or Phase III, and wait until Phases IV and V to make final policy determinations.

Commenters, however, are generally supportive of Bonneville's decision to establish, as a final decision, its decision to sign the Implementation Agreement and establish its principles for joining the EIM as part of this ROD.[113]

Evaluation of Positions

As described above, Bonneville's process for deciding whether and how to join the EIM consists of five phases.

Phase II, the current phase, commenced with the publication of the Proposal, which included Bonneville's position on a number of policy, legal, and technical matters related to the EIM. The Proposal also included a draft Implementation Agreement with the CAISO, the execution of which is the first step in EIM participation. Significantly, Bonneville also identified in the Proposal certain final decisions made in Phase II that are not intended to be revisited during subsequent phases of this decision process unless there is a significant change in the underlying facts or in the way the EIM operates. Among these final decisions are Bonneville's legal authority to join the EIM and the business case supporting Bonneville's participation in the EIM.

Almost all commenters concur with Bonneville's proposal to make a final decision in Phase II to sign the Implementation Agreement.[114] Commenters generally agree that the legal authority and business case justifications support Bonneville's decision to sign the Implementation Agreement and begin working towards full EIM participation.[115] Commenters also generally agree that Bonneville should establish as a final decision its principles for joining the EIM in this ROD. For example, PPC states that it supports Bonneville making a final decision on what its principles will be in Phase II of the decision-making process.[116]

Many commenters, however, object to Bonneville's proposal to make final decisions in Phase II on Bonneville's legal authority to join the EIM and the business case supporting

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[113] *See, e.g.,* PPC Comments at 1, 3; Governor Inslee Comments at 1.
[114] WPAG Comments at 1, 7; Clatskanie Comments at 1; PPC Comments at 1, 4-5; Slice Group Comments at 1; Governor Inslee Comments at 1; NRDC Comments at 1; NRU Comments at 1; NV Energy Comments at 1; NWEC Comments at 1; OPUC/ODOE Comments at 2; PGE Comments at 1; PNGC Comments at 1; Renewable Northwest Comments at 1; Seattle Comments at 1; Snohomish Comments at 1; Tacoma Comments at 1; National Grid Comments at 1; Bonneville Environmental Foundation Comments at 1; AWEA Comments at 1.
[115] *See, e.g.*, WPAG Comments at 7; Tacoma Comments at 1; Clatskanie Comments at 1; NRU Comments at 2; PPC Comments at 2-3, 5-6.
[116] PPC Comments at 1, 3.

BPA-2020-00784-F 0008

Bonneville's participation in the EIM.[117] Instead, commenters suggest Bonneville characterize its conclusions in these areas as "preliminary" or "interlocutory," leaving the final decisions for Phase V.[118] Stakeholders contend that Bonneville's analysis demonstrates there are no "showstoppers" at this point for joining the EIM, but Bonneville should reserve its final determination until Phase V, when more information is known about how Bonneville will participate.[119]

In general, Bonneville believes it is aligned with stakeholders' intent. Bonneville has provided the facts it has considered for EIM participation and is proposing to make decisions based on this information, which is the best information Bonneville has to date. If that information materially changes by Phase V of this decision-process, due to decisions Bonneville makes or other aspects outside of Bonneville's control, Bonneville will consider that updated information as it evaluates whether joining the EIM is consistent with its legal and business principles. Substantively, this approach seems to be in line with what commenters are requesting.

Where Bonneville disagrees with commenters is on their labeling the legal authority and business case decisions as "preliminary" or "interlocutory." Bonneville identified the legal authority and business case as final decisions because Bonneville views both issues as threshold issues for moving forward with joining the EIM. The legal and business cases supporting Bonneville's decision to sign the Implementation Agreement are the same for supporting Bonneville's decision to join the EIM. Thus, if a problem exists in the legal or business case Bonneville uses to support its decision to sign the Implementation Agreement, that same problem would exist in Bonneville's decision to join the EIM. The converse of this point is also true. A problem with Bonneville's legal authority or business case supporting participation in the EIM would necessarily call into question Bonneville's decision to sign an Implementation Agreement to join that market. Bonneville, thus, designated these analyses as "final" to ensure that stakeholders understood upfront and early Bonneville's justification and rationale for moving forward with joining the EIM. Importantly, this approach allowed stakeholders an early opportunity to identify fundamental flaws in Bonneville's business or legal cases. To that point, Bonneville's proposal has largely achieved its intended result. Although some customers request additional information on the mechanics of Bonneville's compliance with legal requirements, which are addressed in section 3.2, and request additional information on

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[117] AWEC Comments at 4; Clatskanie Comments at 1-2; NRU Comments at 2; PNGC Comments at 1; PPC Comments at 1; Slice Group Comments at 2-3; Snohomish Comments at 2; Tacoma Comments at 1; WPAG Comments at 2-3, 5-6.
[118] *See* Clatskanie Comments at 1-2; PPC Comments at 1, 3; NRU Comments at 2; Slice Group Comments at 3-4; WPAG Comments at 6.
[119] *See, e.g.,* NRU Comments at 2; PPC Comments at 3, 4; Clatskanie Comments at 1.

BPA-2020-00784-F 0008

the business case, which is addressed in section 3.4, they have found no critical flaws in the legal and business cases that Bonneville has put forth. It is thus Bonneville's intent to continue to characterize these decisions as final and not revisit them unless there is a significant change in the underlying facts or in the way the EIM operates.

As described in the Preface to this ROD, Bonneville sees this ROD as a turning point in its decision making process. Signing the Implementation Agreement initiates a process to determine how Bonneville will participate in the EIM and commits Bonneville to expend funds both to the CAISO and on internal processes and systems. While the ultimate decision whether to join the EIM remains for Phase V, the nature of Bonneville's evaluation of EIM participation in Phases III and IV will focus on preparations to begin EIM operations in the spring of 2022. Bonneville is committed to stakeholder input and involvement throughout the remaining implementation phases and will weigh its EIM implementation decisions against the principles set forth in this ROD.

With the above explanation, Bonneville believes it has addressed the primary concerns raised in the stakeholders' comments. Nonetheless, Bonneville acknowledges that stakeholders have presented a variety of arguments to support their position that Bonneville wait until Phase V to label its decisions on its business and legal cases as final. Bonneville responds to those contentions below by general topic area.

New Information May Arise Between Phase II and Phase V.

Several commenters argue that Bonneville should not identify its business or legal case as final because of the possibility that changes may occur between Phase II and Phase V that would undermine a key assumption used in making a final decision on the legal and business case. For example, WPAG states that the voluntariness of the EIM is a keystone of the legal analysis supporting Bonneville's determination that it can participate in the EIM.[120] If that assumption were to cease to be true, "many of the legal conclusions reached in the Proposal would fail, gravely impairing any Phase V decision to join the market."[121]

PPC raises a similar comment. PPC notes that the Cost Benefit Analysis should be reviewed in Phase V so that any updated information is properly considered. PPC contends this information will come as PPC learns more about how Bonneville will participate in the EIM. PPC also notes that there are potential changes in the EIM that could affect the expected benefits and the business case for joining the EIM.[122]

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[120] WPAG Comments at 5-6.
[121] *Id.* at 6.
[122] PPC Comments at 6.

BPA-2020-00784-F 0008

AWEC notes that it is important to refresh the business case analysis in Phase V to ensure the viability of Bonneville's decision to join. The risk, in AWEC's view, is that a final decision based on data from 2018 and 2019 would be outdated in 2021, when Bonneville actually decides to join the EIM.[123]

Snohomish also supports moving the final determination to join the EIM to Phase V to ensure changes are addressed. Snohomish notes that at that point Bonneville and its stakeholders will be in a better position to take into account the complete record. In addition, the record will reflect the decisions made in Phases III and IV, and provide Bonneville an opportunity to reevaluate its decision to join the EIM in the event market rules, operational changes, or other material changes in EIM market design come to light.[124] Other commenters raise similar arguments.[125]

Bonneville recognizes that things may change between this ROD and Phase V. These changes, as stakeholders contend, may undermine a key assumption used in the legal or business case decided in this ROD. The flexibility to consider these changes is captured in the description of the finality for the business and legal cases: "these decisions will not be revisited during subsequent phases of this decision process unless there is a significant or material change in the underlying facts or in the way the EIM operates."[126] A similar qualifier is included in the legal analysis:

> The following legal assessment is based on Bonneville's current understanding of the EIM. If there are significant structural or organizational changes to the EIM after this decision, Bonneville will evaluate those changes as Bonneville moves through the implementation stage toward participation to ensure continued consistency with Bonneville's legal obligations.[127]

These statements provide important qualifiers to the finality of Bonneville's decisions and generally align with commenters' requests that Bonneville have the flexibility to modify its decisions to address new facts and circumstances. These qualifiers allow both Bonneville and stakeholders an opportunity to identify significant changes that warrant further review. Thus, for example, if the voluntary aspects of the EIM were to be removed (as posited by WPAG), stakeholders would have the ability to request Bonneville to revisit its legal authority to join the EIM (assuming Bonneville had not already done so). Similarly, if

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[123] AWEC Comments at 4.
[124] Snohomish Comments at 2.
[125] PPC Comments at 6; Slice Group Comments 3-4; WPAG Comments at 5; Snohomish Comments at 2.
[126] *See* section 2.0.
[127] *See* section 3.2.1.

BPA-2020-00784-F 0008

the underlying economics of the EIM were to fundamentally change between now and Phase V, Bonneville could update its business case to reflect those changes. In short, Bonneville's proposal is to maintain the flexibility to address the type of significant changes commenters appear to be concerned could occur between now and Phase V. Even more, the ability to identify significant changes is not relegated to only Bonneville. Stakeholders can raise concerns with a decision or detail that occurs between now and Phase V that calls into question Bonneville's ability to meet its legal and business principles in the Phase V Close-Out Letter process. That is precisely the purpose of having legal and business principles reviewed in Phase V: to make sure all additional decisions are consistent with those principles.

Bonneville and Stakeholders Will Have Greater Understanding of EIM Implementation in Phase V

Several stakeholders also urge Bonneville to delay making final decisions on the legal authority and business case until Phase V because Bonneville and stakeholders will at that point have a more complete understanding of how the EIM will affect Bonneville and its customers. For example, Clatskanie urges Bonneville to wait to make its final decision on the business case because stakeholders' and Bonneville's understanding of the implications of the EIM on Bonneville's operations and business model will likely evolve.[128] Clatskanie is concerned that such evolution may not be due to a "significant change in the underlying facts or in the way the EIM operates" but due to a "fuller understanding of how BPA's unique statutory framework and business model will interact with the EIM."[129]

The Slice Group submitted a similar comment, noting "[i]n Phase V, Bonneville and its customers will have a more robust understanding of the strategic importance of participation."[130] The Slice Group notes that by moving the final determinations on these matters to the end of the process, "Bonneville and its stakeholders would be able to take into account the preliminary Phase II determinations, the policy decisions and implementations from Phases III and IV, and any significant changes to EIM market rules or operations that could emerge before the conclusion of Phase V."[131]

Bonneville acknowledges that Bonneville and stakeholders will gain a greater understanding of the EIM as Bonneville moves toward the implementation phases of its process. But, Bonneville does not agree that it must wait until all specific details of EIM implementation are resolved and decided before evaluating whether it has the legal

[128] Clatskanie Comments at 2.
[129] *Id.*
[130] Slice Group Comments at 5.
[131] *Id.* at 4.

BPA-2020-00784-F 0008

authority or business basis for joining the EIM. Bonneville believes it can, and indeed must, evaluate its legal authority and business case for joining the EIM based on the currently available information. This information came as the product of an extensive public process that has spanned over a year and included multiple stakeholder meetings and educational sessions with Bonneville staff and outside experts. Based on this process, Bonneville believes it has a sufficient understanding of the EIM and its impacts on Bonneville's system and operations to decide that signing the Implementation Agreement and, eventually, joining the EIM is consistent with its legal authority and supported by a positive business case. Stakeholders do not disagree; they have instead identified implementation questions which should not change the overall outcome of the business case, and have not identified any fatal flaws or significant shortcomings in Bonneville's legal or business case analyses.

Stakeholders note, though, that the final decisions identified in the legal authority area lack specific details on how Bonneville will meet its various obligations. For example, NRU, WPAG, and PPC all point to Bonneville's statutory obligations to provide preference to federal power and to sell power from its system resources as areas that warrant further exploration before Bonneville concludes that it has the legal authority to join.[132] AWEC also notes that whether joining the EIM is consistent with Bonneville's system sales and contractual obligations depends on implementation decisions that have yet to be finalized.[133] The Slice Group raises a similar point, noting that the Phase V process will provide the forum for determining whether the EIM complies with Bonneville's contractual obligations.[134]

Bonneville agrees that additional discussion and analysis will occur in and through Phases III, IV, and V regarding how Bonneville meets its statutory and contractual obligations. Invariably, as Bonneville and stakeholders move from considering whether to join the EIM, to how to join the EIM, questions regarding the interplay between specific EIM operations and obligations and specific Bonneville contractual and statutory obligations will arise. By deciding in this ROD that Bonneville has the legal authority to join the EIM, Bonneville is not also predetermining how it will meet its obligations in every specific instance. Stakeholders will certainly be involved in these discussions, and their input will shape Bonneville's implementation decisions. Thus, for example, Bonneville may propose one method for complying with its statutory or contractual obligations in the EIM. Stakeholders may disagree with that method and propose another. No decision in this ROD precludes this dialogue and further development. What is precluded by the final decisions in this ROD (barring any significant factual or EIM operational changes) is a claim that this

[132] NRU Comments at 8; PPC Comments at 4-5; WPAG Comments at 6.
[133] AWEC Comments at 4.
[134] Slice Group Comments at 5.

BPA-2020-00784-F 0008

dialogue cannot happen. That is, through these final decisions, Bonneville is seeking to preclude arguments that under no circumstance can Bonneville participate in the EIM and comply with its statutory or contractual obligations. Bonneville believes the final decisions in this ROD have achieved closure on these points. However, Bonneville intends to address in future discussions the specific implementation questions raised by stakeholders.

Integrity of Phase V Process

Stakeholders also argue that delaying the final decisions on the legal and business cases is important for procedural reasons. Several stakeholders note that Bonneville intends to state in Phase V how joining the EIM is consistent with Bonneville's principles, which include that joining the EIM is consistent with the agency's legal authority and is a sound business decision supported by a business case. They ask, if Bonneville makes final decisions on these items in Phase II of the process, how can Bonneville make a meaningful assessment of the associated principles in Phase V of the process?[135] For example, the Slice Group supports classifying the Cost Benefit Analysis and legal analysis as "preliminary" and using it to support signing the Implementation Agreement as a sound business decision. The Slice Group claims that calling the business case and legal case "final" would pre-determine the Phase V step of determining the consistency with Bonneville's principles.[136]

WPAG raises a similar concern in its comments. WPAG states that its concern is the

> interplay between a final decision as to BPA's legal authority and business case for joining the EIM in the September 2019 ROD, and BPA's promise to later demonstrate in Phase V consistency between any decision to join the EIM with BPA's EIM principles. This is because BPA's EIM principles include that EIM participation is consistent with BPA's statutory, regulatory, and contractual obligations as well as that BPA's participation will be based on a sound business rationale.[137]

WPAG states that "BPA should make these decisions only final as to signing the Implementation Agreement and tentative or interlocutory with respect to joining the EIM."[138] WPAG argues that it does not believe Bonneville can make a final determination on the legal and business cases "without undermining the spirit and purpose of Phase V."[139]

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[135] *Id.* at 4-5.
[136] Slice Group Comments at 4-5.
[137] WPAG Comments at 3.
[138] *Id.*
[139] *Id.*

BPA-2020-00784-F 0008

PPC argues that the addition of Phase V to the agency's decision process was very important because it will allow Bonneville to use its participation principles to evaluate all the information learned during the scoping process. Only after that evaluation will the agency be positioned to make a well-informed final decision about participation. Given the importance of the Phase V review, it is not appropriate at this time to make any final determinations that would undermine that final review of Bonneville's participation during Phase V.[140]

As just discussed, nothing precludes stakeholders from raising in Phase V changes that they believe undermine Bonneville's ability to meet its principles. Bonneville is not deciding here and now whether joining the EIM is consistent with Bonneville's principles. If the facts underlying the business case significantly change or the rules for EIM participation are fundamentally altered, stakeholders may raise those issues in Phase V. Thus, the integrity of the Phase V review is not undermined or "pre-determined" by Bonneville making final decisions in this ROD as to the legal basis and business case for joining the EIM.

Need for Bonneville's Decisions in Phase III

Stakeholders contend that there are a number of Bonneville decisions that will be decided in later phases that could influence Bonneville's legal authority and the business case supporting Bonneville's participation. For instance, NRU highlights a number of rate allocation and product issues that NRU believes must be addressed before Bonneville "can determine if joining the EIM is a sound business decision."[141] NRU notes that "[u]ntil there are decisions made on how costs and benefits will be allocated between and within each business line, it is premature to address whether BPA joining the EIM is a sound business decision."[142] PNGC raises a similar argument. PNGC comments that Bonneville intends to "verify" many of the assumptions in the Cost Benefit Analysis in the implementation phase.[143] While the initial analysis shows promising "upside," PNGC contends it would be prudent to reserve the final decision to join the EIM until "after all due diligence has been completed."[144] PNGC urges Bonneville to save its final judgement on the business case "until the assumptions have been verified at the end of BPA's proposed timeline." In particular, PNGC notes that until PNGC understands the "net" cost/benefit to PNGC and its members due to Bonneville's participation, PNGC "cannot fully support BPA's Staff's request for support of the current EIM business case as the final justification for joining the

[140] PPC Comments at 2-3.
[141] NRU Comments at 4-5.
[142] *Id.* at 2.
[143] PNGC Comments at 1.
[144] *Id.*

BPA-2020-00784-F 0008

EIM in 2022."[145] WPAG states that the allocation of EIM related costs and benefits is "another example [of] where legal compliance will likely depend on BPA's implementation decisions."[146] AWEC makes a similar request in its comments.[147]

Bonneville will address commenters' specific concerns with the business case in section 3.4 and legal questions in section 3.2. Bonneville's Phase III and IV decisions focus on the implementation details of positioning Bonneville to join the EIM. While implementation details still remain (as noted above), Bonneville has concluded that it has the legal authority and business case to proceed with joining the EIM. If Bonneville were to fundamentally change an aspect of its participation in Phase III, as commenters appear to suggest, then this change would likely require a revision to the legal and/or business case. But, absent such a fundamental change, it is unlikely that the decisions in Phase III would affect the foundational legal or business justification for joining the EIM.

NRU and WPAG point to Bonneville's rate case and the cost allocation decisions as examples of Phase III and IV decisions that are important components of the agency's legal and business justification.[148] Bonneville acknowledges that its cost allocation decisions will impact its customers and that cost allocation remains a key issue to be decided. Bonneville is committed to working with stakeholders through these issues in Phases III and IV and intends to establish rates in its rate cases consistent with its governing statutes. While cost allocation issues must be addressed, Bonneville does not view these decisions as affecting the underlying business case or legal basis for joining the EIM. Bonneville's business case for joining the EIM looks at the benefits to Bonneville of joining the EIM. These benefits will inure to Bonneville's customers through either lower rates or more reliable service. Those benefits would not change because of a particular cost or benefit allocation determined in the rate case. Similarly, the legal case determined that, after considering Bonneville's statutory and contractual obligations, Bonneville has the authority to participate in the EIM. This legal finding would not change because of the rate choices Bonneville makes in its rate cases to distribute the benefits and costs of the EIM among its customers. For these reasons, Bonneville does not view the outcome of the rate case as an essential element that must be determined prior to making decisions on the business and legal cases.

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[145] *Id.* at 2.
[146] WPAG Comments at 6.
[147] AWEC Comments at 2.
[148] WPAG Comments at 6; NRU Comments at 4-5.

BPA-2020-00784-F 0008

Other Reasons and Issues

Some commenters question whether Bonneville should describe any of its decisions as "final" in this ROD. These comments note that the Proposal is confusing or unclear in its labeling of various decisions. For example, AWEC requests Bonneville clarify the scope of issues for which its legal determination is final, and those for which it is only preliminary.[149] AWEC notes that Bonneville has identified its analysis as "preliminary" in some instances, but also "final" in others.[150] AWEC requests that Bonneville be clear about what decision is being made at this time, and how affected parties should view the effect of the ROD's decisions.[151] The Slice Group makes a similar comment. They recommend Bonneville describe its decisions as "preliminary" to avoid confusion on the finality of its decision.[152]

Bonneville understands how some of the labelings could seem confusing given where we are in the process. Bonneville believes that, with the foregoing discussion, it has clarified its position as to the finality of its decisions in Phase II, including the decisions related to the legal and business cases. Bonneville plans to move forward toward joining the EIM, with the exception that it would revise its decisions if there are significant changes in the underlying facts or in the way the EIM operates. To be clear, Bonneville's intent is not to ignore concerns that stakeholders may have with the implementation details of joining the EIM; however, the overall benefits should not change with these implementation details. A vast amount of work remains to prepare Bonneville and its customers for participation in the EIM. By signing the EIM Implementation Agreement Bonneville is moving beyond the EIM exploration stage. Signing the agreement signifies that Bonneville has done its exploration and believes that joining the EIM will provide positive benefits for Bonneville and its customers and is legally supportable based on information known to date.

AWEC notes that the Proposal included references to "preliminary determination" in some places and "final" decisions in others.[153] Bonneville used the term "preliminary" to indicate that Bonneville was still open to revising its decision pending the comments on the Proposal from stakeholders; it was not Bonneville's intent to connote that the decisions in this ROD were also preliminary. Having received those comments on the Proposal, and considering no stakeholder has found a flaw in Bonneville's analysis, Bonneville has removed the reference to "preliminary" in this ROD.

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[149] AWEC Comments at 4.
[150] *Id.*
[151] *Id.* at 1.
[152] Slice Group Comments at 2-3, 4.
[153] AWEC Comments at 4.

BPA-2020-00784-F 0008

PPC does not believe Bonneville should state a position on whether it is making any final decisions. PPC contends Bonneville should not state what is and is not final, as this determination is made by the courts. PPC notes that Bonneville's characterization of its decision as final, while relevant to the court's decision, is not controlling.[154]

Bonneville disagrees with PPC's assertion and believes the court and many stakeholders appreciate Bonneville being clear as to what its process is and whether it intends a decision to be final. While stakeholders do not need to agree with Bonneville in its assertion of finality or ripeness, for purposes of transparency, Bonneville believes it is better to set out its process and the significance it is placing on that process as explicitly as possible. This allows customers to provide input at the time when that input can be meaningfully considered by the agency. Further, Bonneville has a history of setting out its position on what issues it considers as final and what issues will be decided later.[155]

PPC's suggestion that Bonneville should avoid making any final decisions in this ROD would be impractical, as making decisions in each phase of Bonneville's process is critical to progressing forward in the discussion on joining the EIM. As this ROD describes, there are upwards of twenty identified policy, technical, and rate topics that Bonneville and its customers must work through to prepare Bonneville for EIM implementation. This list does not include the multitude of potential sub-issues within each general area and the additional issues stakeholders have asked to be added to Phase III. Given the enormity of the remaining work, it is essential that Bonneville make final decisions within each phase to move forward with EIM implementation. A regular cadence of decisions will help focus stakeholder attention and comments to the relevant policy and technical issues that must be decided, thereby progressing Bonneville and stakeholders to a fuller understanding of what EIM participation means and would look like for Phase V. If Bonneville makes no decisions in any phase, leaving all issues available for further discussion, Bonneville does not see how any progress could be made or how Bonneville would be prepared by late 2021 to determine whether joining the EIM is consistent with its principles.

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[154] PPC Comments at 3.

[155] *See, e.g.,* Bonneville Power Administration, Long-Term Regional Dialogue Final Policy, at 25 ("[t]his Policy regarding NLSLs is a final action"), 35 ("[t]his Policy regarding direct assignment is a final action") (July 2007), *available at* https://www.bpa.gov/p/Power-Contracts/Regional-Dialogue/rdi/07-19-07_RD_Policy.pdf.

BPA-2020-00784-F 0008

Decision

Bonneville considers its decisions on the legal case and business case final decisions for purposes of signing the EIM Implementation Agreement and moving forward toward joining the EIM. Bonneville will review the legal and business implications of any significant changes in underlying facts or in the way the EIM operates during Phase V, when it assesses whether all decisions are consistent with the legal and business principles, as well as the other principles discussed in section 3.1.

BPA-2020-00784-F 0008

3.0 Determinations and Policies for Joining the EIM

3.1 Bonneville's EIM Participation Principles

Given Bonneville's status as a federal power marketing administration and mandate to market the output of federal resources while reliably serving loads in the Pacific Northwest, Bonneville believes it is important to first identify and apply a set of foundational principles to its potential participation in the EIM. Bonneville proposed four principles, discussed below, in its Proposal. Several stakeholders commented on the principles which are also summarized below. This section concludes with Bonneville's consideration of the comments and a final decision regarding what principles it will use to evaluate whether it should participate in the EIM.

Bonneville first identified and solicited feedback on a set of principles at its October 11, 2018, EIM stakeholder meeting. Bonneville identified, discussed, and reviewed the principles in every subsequent monthly stakeholder meeting. Bonneville modified the principles in response to stakeholder comments since first proposing them.

As discussed in section II, Bonneville will continue to apply these principles throughout the EIM process. The principles will form the basis for Bonneville's decision in the Close-Out Letter to either participate or not participate in the EIM.

It is important to note that these principles are high-level and foundational to Bonneville's participation in the EIM. As Bonneville progresses through the process of joining the EIM, certain issues will require the development and application of more specific principles. For example, the potential development of additional standards regarding resource sufficiency within Bonneville's balancing authority area or the allocation of the benefits/costs of EIM participation will likely require more specific principles. Such principles will be developed in the appropriate stakeholder process during Phase III.

Bonneville's Proposed Principles

In the Proposal, Bonneville proposed to adopt the following four principles.

1. *Participation Is Consistent with Statutory, Regulatory, and Contractual Obligations*

Bonneville's potential EIM participation must be consistent with its statutory, regulatory, and contractual obligations. Section 3.2 discusses whether Bonneville's participation would be consistent with these obligations. Bonneville's analysis concludes that Bonneville's participation would be. In the event Bonneville determines in the future that EIM participation would no longer be consistent with these obligations, it would cease participating in the market and address the inconsistency. Conceptually, this could arise if

BPA-2020-00784-F 0008

the CAISO implemented a Tariff provision or business practice, or FERC ordered a change to the current EIM, that was inconsistent with the statutory, regulatory, or contractual obligations applicable to Bonneville.

2. Maintain Reliable Delivery of Power and Transmission to Our Customers

Even if Bonneville joins the EIM, Bonneville, in coordination with its federal partners, will retain its responsibility for the operation of the federal power and transmission systems. Joining the EIM does not obviate Bonneville's responsibility regarding system reliability. If Bonneville were to determine in the future that EIM participation impaired its ability to maintain the reliability of the federal power or transmission systems, it would stop participating in the EIM and address the reliability issue. In fact, participation in the EIM should help system reliability in terms of managing transmission constraints on Bonneville's transmission system.[156]

3. Resource Participation in the EIM Is and Always Will Be Voluntary

In regard to resource participation, the EIM is a voluntary market. Owners/operators of resources inside the Bonneville balancing authority area can choose whether to participate or not. As described in section 1.3, those that choose to participate, including Bonneville on behalf of the federal generating resources, must execute a Participating Resource Agreement with the CAISO. Moreover, even owners/operators that sign a Participating Resource Agreement with the CAISO are not required to submit bids for any particular market interval. Stated another way, the EIM does not impose "must-run" requirements on any resources within an EIM balancing authority area. Bonneville recognizes that in some cases, if it chooses not to bid federal generation into the EIM, there may be a reduction in dispatch benefits. Furthermore, Bonneville, in its role as an EIM entity, may choose to separate from or exit the EIM if conditions arise that are inconsistent with these principles.

4. Bonneville's Decision to Participate in the EIM Will Be Based on a Sound Business Rationale

Bonneville's decision whether to join the EIM will be based on a reasoned business decision. The decision will include a business case which considers both quantitative and qualitative benefits to power and transmission as well as the strategic value of joining the EIM. The business case is discussed in section 3.4.

[156] Bonneville's system operations tools are discussed in Section 3.5.3.

BPA-2020-00784-F 0008

Issue 3.1.1

What foundational principles should Bonneville adopt for its potential participation in the EIM?

Commenters' Positions

Bonneville received several comments about the participation principles. All were supportive of Bonneville having principles to guide the process, but most requested Bonneville consider modification of some of the principles.

PPC supports the adoption of principles to guide the process and set expectations for a final decision, but recommends a modification of the principles.[157] PPC proposes five principles that it believes would provide consistency with the goals in Bonneville's Strategic Plan.[158] PPC argues that its principles, initially proposed in a June 17, 2019 letter to Bonneville, provide clarification to address gaps in Bonneville's principles and align with customers' interests.[159] PPC's proposed principles include:

1. Bonneville's participation is consistent with its statutory, regulatory, and contractual obligations.

2. Bonneville maintains reliable delivery of power and transmission to its customers.

3. Bonneville's participation in the EIM is discretionary and Bonneville retains its ability to effectively exit the market in the event participation is no longer consistent with these principles.

4. Bonneville's participation is consistent with a sound business rationale and advances the objectives of Bonneville's Strategic Plan, including providing competitive products and services, by capturing the full value of its power and transmission system.

5. Bonneville's evaluation of EIM participation includes transparent consideration of the commercial and operational impacts on its products and services.

NRU, PGP, Slice Group, and Seattle support PPC's proposed principles and recommend that Bonneville adopt PPC's principles instead of Bonneville's proposed principles.[160] Further,

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[157] PPC Comments at 1.
[158] *Id.* at 4 and Attachment 1.
[159] *Id.* at 4.
[160] NRU Comments at 3; PGP Comments at 1; Slice Group Comments at 4; Seattle Comments at 2.

BPA-2020-00784-F 0008

WPAG agrees with PPC that the third principle regarding voluntariness of market participation should be more broadly stated and not limited only to resource participation. WPAG also asserts that Bonneville should replace the third principle with the voluntariness provision set forth in section 14(b) of the Implementation Agreement.[161] WPAG also specifically supports the inclusion of PPC's fifth principle regarding transparent consideration of commercial and operational impacts.[162]

Clatskanie asserts that a sound business decision should include a consideration of the impacts of EIM participation on Bonneville's current products and services.[163]

Seattle also notes that certain issues may require new principles as Bonneville progresses through the process to join the EIM.[164]

Governor Inslee agrees that Bonneville should be guided by the four principles in the Proposal.[165]

Evaluation of Positions

Bonneville appreciates the interest and robust consideration of its proposed participation principles by stakeholders.

PPC's first two proposed principles align with Bonneville's proposed principles. Thus, those principles, as proposed by Bonneville, will be adopted without modification.

In regard to Bonneville's third proposed principle regarding the voluntary nature of the EIM, Bonneville agrees with PPC that a more robust principle providing that Bonneville's EIM participation is discretionary and that Bonneville will retain the ability to exit the market if participation is no longer consistent with these principles is warranted.[166] Thus, Bonneville will adopt PPC's third principle as proposed.

Bonneville does not believe it is necessary to adopt the voluntariness language in section 14(b) of the Implementation Agreement verbatim as a participation principle as WPAG suggests. The substance of PPC's proposed third principle captures the elements set forth

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[161] WPAG Comments at 4.
[162] *Id.* at 5.
[163] Clatskanie Comments at 2.
[164] Seattle Comments at 2.
[165] Governor Inslee Comments at 1.
[166] It is worth noting that every executed EIM Entity Agreement to date allows EIM Entities to unilaterally terminate the agreement and withdraw from the market after notice is provided. If Bonneville progresses to executing an EIM Entity Agreement, it fully expects that same right to be provided in its EIM Entity Agreement with the CAISO.

BPA-2020-00784-F 0008

in section 14(b). Bonneville anticipates that the substance of section 14(b) will likely be memorialized in subsequent participation agreements (*i.e.*, the EIM Entity Agreement) with the CAISO.

Bonneville believes it is appropriate to separate PPC's fourth proposed principle into two separate principles: one addressing a sound business rationale for Bonneville's EIM participation and the other addressing consistency with Bonneville's Strategic Plan. A sound business rationale generally connotes that Bonneville's decision is based on a consideration of the quantitative, qualitative, and strategic benefits. A sound business decision may also consider other things such as alignment with Bonneville's strategic direction, operations, and policies. Ultimately, a sound business rationale requires that Bonneville perform and demonstrate a holistic analysis considering the pertinent factors.

Bonneville will also include a principle providing that EIM participation must be consistent with its Strategic Plan. That said, it is unnecessary to include the additional language to this principle proposed by PPC regarding the provision of competitive products and services that capture the full value of the federal power and transmission systems, to the exclusion of the rest of the Strategic Plan. A general statement regarding consistency with Bonneville's Strategic Plan is sufficient because the plan itself explicitly includes the consideration of Bonneville's products and services and capturing the full value of the federal power and transmission systems as two of its goals.

Bonneville will include PPC's last proposed principle regarding Bonneville's evaluation of EIM participation including a consideration of the commercial and operational impacts on its products and services. Inclusion of this principle addresses concerns by stakeholders regarding whether Bonneville will consider the impacts of EIM participation on its products and services offerings.

As explained in the introduction section above, Bonneville agrees with Seattle that certain issues may require new principles as Bonneville progresses through the process to join the EIM.

Decision

Bonneville adopts the following EIM participation principles that it will use throughout the process of joining the EIM, including a final determination for each principle set forth in the Close-Out Letter:

1. *Bonneville's participation is consistent with its statutory, regulatory, and contractual obligations.*

BPA-2020-00784-F 0008

2. *Bonneville will maintain reliable delivery of power and transmission to its customers.*

3. *Bonneville's participation is discretionary and Bonneville retains its ability to effectively exit the market in the event participation is no longer consistent with these principles.*

4. *Bonneville's participation is consistent with a sound business rationale.*

5. *Bonneville's participation is consistent with the objectives of Bonneville's Strategic Plan.*

6. *Bonneville's evaluation of EIM participation includes transparent consideration of the commercial and operational impacts on its products and services.*

3.2 Bonneville's Legal Authority to Join the EIM

3.2.1 Introduction

Joining the EIM will require operational changes for both Bonneville power and transmission functions, and it will expose Bonneville to new governance and regulatory structures. Bonneville's legal evaluation of the proposed changes at this early stage of the decision process is critical to ensure that there are no legal barriers to Bonneville's potential participation. It is also important to identify the important legal issues early in the process to inform the stakeholder process.

Bonneville's determination is that it has the legal authority to join the EIM and that a decision to join the EIM is consistent with its statutory obligations and legal requirements. Bonneville assessed the following issues to determine whether Bonneville's statutory and contractual obligations are consistent with a decision to join the EIM.

1. General authority to operate in a business-like manner and to join the EIM

2. Obligations with respect to preference to power and surplus power requirements

3. Obligation to make sales from the Federal System and bidding power into the EIM from specific projects or groups of projects

4. Statutory authority to provide transmission service

5. Consistency with contractual commitments: Power Contracts and Transmission Contracts

6. Federal Energy Regulatory Commission jurisdiction with respect to Bonneville as an EIM entity

BPA-2020-00784-F 0008

7. Market oversight under the CAISO Tariff

8. Governance

The following legal assessment is based on Bonneville's current understanding of the EIM. If there are significant structural or organizational changes to the EIM after this decision, Bonneville will evaluate those changes as it moves through the implementation stage towards participation to ensure continued consistency with Bonneville's legal obligations.

3.2.2 Sound Business Decision

Bonneville's Position

Since its inception, Congress has imbued Bonneville with broad statutory authority to market the power produced by the federal projects. In the Bonneville Project Act of 1937, the Secretary of the Army was directed to provide the Administrator with such space and equipment at the Bonneville Dam as may be necessary to transmit the energy produced at the dam "to the markets which the administrator desires to serve."[167] Congress also granted Bonneville broad contracting authority for the specific purpose of allowing Bonneville to operate like a business in the marketing of federal power.[168] As the designated "marketing agent" for all electric power generated by the Federal Columbia River Power System,[169] Bonneville must set rates for the sale of power from these projects pursuant to several principles, including setting rates "consistent with sound business principles."[170] Bonneville's statutes are unique with repeated focus on the business-related aspects of the agency's authority.

Both Congress and the courts have reaffirmed Bonneville's authority to operate in a business-like manner. As summarized in a 1977 Senate Report:

> [The] legislative history [of the statutes governing BPA's operations] reflects a congressional recognition of the significant role played by BPA in the Pacific Northwest, and an effort to enable this organization to operate in a businesslike fashion and to free it from the requirements and restrictions ordinarily applicable to the conduct of Government business. The transfer of the functions of BPA from the Department of the Interior to the Department

[167] Bonneville Project Act of 1937, 16 U.S.C. § 832a(a).
[168] *Id.* at § 832a(f); *See* S. R. No. 469, 79th Cong., 1st Sess. 13 (1945) ("[BPA] operates a business enterprise . . . .") (letter from Interior Secretary Ickes).
[169] Federal Columbia River Transmission System Act of 1974, 16 U.S.C. § 838f.
[170] Flood Control Act of 1944, 16 U.S.C. § 825s.

BPA-2020-00784-F 0008

> of Energy is not intended to diminish in any way the authority or flexibility which is a requisite to the efficient management of a utility business.[171]

The ability of Bonneville to adapt to the ever-changing landscape of the energy market like a business is particularly important because the Administrator must implement many, and often competing, statutory directives. Similarly, the Ninth Circuit Court of Appeals has noted that "[The Administrator] must continue to run [Bonneville] like a business on a sound financial basis, enabling it to repay its debt to the federal treasury in a timely fashion, while discharging costly new public duties assumed after the Northwest Power Act's passage."[172] Further, Bonneville must explain how its decision furthers the agency's business interests or its public mission.[173]

The EIM presents a unique opportunity for Bonneville to further its business interest by entering a new market that is expected to provide Bonneville, through its transmission and power functions, significant economic and operational benefits. Much of the western half of the United States is undergoing unprecedented changes in its energy industry and markets. As described earlier, almost all of Bonneville's interconnected balancing authorities in the West have or are in the process of joining the EIM. If Bonneville takes no action, it could stand alone as the sole western balancing authority area to choose not to take the opportunity to benefit from participation in the EIM. Bonneville's consideration of whether to join or participate in an EIM in furtherance of its power and transmission marketing efforts is an important consideration in how Bonneville will meet its mission objectives in the future.

As explained below in section 3.4, Bonneville's decision to join the EIM would be founded on significant projected quantitative and qualitative benefits to Bonneville and its customers. In addition, Bonneville believes that joining the EIM will support its ability to meet its statutory obligations. Bonneville's proposed model for participating in the EIM is intended to further Bonneville's business interests consistent with its public mission and to ensure its public and contractual responsibilities and obligations continue to be met first.

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[171] S. R. No. 164, 95th Cong., 1st Sess. 30 (1977), reprinted in 1977 U.S.C.C.A.N. 854, 884.
[172] *Ass'n of Pub. Agency Customers v. Bonneville Power Admin.*, 126 F.3d 1158, 1170-71 (9th Cir. 1997).
[173] *Pac. Nw. Generating Co-op v. Bonneville Power Admin.*, 550 F.3d 846, 861 (9th Cir. 2008).

BPA-2020-00784-F 0008

Issue 3.2.2.1

Whether the Administrator's decision to join the EIM furthers Bonneville's business interests consistent with its power marketing directives and legal requirements.

Commenters' Positions

Several commenters agree that Bonneville's decision to sign the Implementation Agreement and, eventually, join the EIM is a sound business decision.[174] Other commenters, however, contend Bonneville should not decide in this ROD whether joining the EIM is a sound business decision.[175] These stakeholders generally contend that Bonneville's existing business case, while sufficient to sign the Implementation Agreement, is insufficient to support a final decision that EIM participation is a sound business decision. They request Bonneville make this decision in Phase V, when evaluating its principles.[176]

Evaluation of Positions

Stakeholders' concerns with the finality of Bonneville's decisions are discussed at length in section 2. As described in that section, Bonneville's decision is that joining the EIM is a sound business decision based on the facts and circumstances as they are presently understood in the business case. Bonneville does not intend to revisit this decision, excepting that if significant facts or operations of the EIM change between now and Phase V, Bonneville would revisit any relevant aspects of its analysis to reflect those fundamental changes. Stakeholders will have an opportunity to comment on whether such changes have occurred in the Phase V Close-Out Letter process.

Bonneville addresses stakeholders' concerns with the sufficiency of the business case in section 3.4 below. In that section, Bonneville describes the significant quantitative and qualitative benefits of joining the EIM.

Apart from the financial and operational benefits, joining the EIM also furthers Bonneville's strategic interest. By joining the EIM, Bonneville will have a stronger voice in the EIM's development and improvement. With Bonneville as an EIM Entity, Bonneville can help influence the EIM to take into account Bonneville's particular needs and obligations. The

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[174] Governor Inslee Comments at 1; NRDC Comments at 1-2; Renewable Northwest Comments at 2; OPUC/ODOE Comments at 1; AWEA Comments at 1.
[175] Clatskanie Comments at 2; NRU Comments at 2; AWEC Comments at 1-2; PNGC Comments at 1; PPC Comments at 6; Seattle Comments at 2; Slice Group Comments at 5; WPAG Comments at 5-7.
[176] *Id.*

BPA-2020-00784-F 0008

ability to proactively address Bonneville's needs in the EIM's design, then, is an important element of Bonneville's business decision to join the EIM. The importance of having a voice in the EIM's design will only grow as the CAISO and other EIM Entities consider expanding the EIM through EDAM and other market initiatives.

Decision

The Administrator's decision to join the EIM furthers Bonneville's business interests consistent with its power marketing directives and legal requirements.

3.2.3 Preference and Surplus

Bonneville's Position

Preference

Bonneville's authority to sell federal power is grounded in several statutes: the Bonneville Project Act of 1937,[177] the Pacific Northwest Consumer Power Preference Act of 1964,[178] the Federal Columbia River Transmission System Act of 1974,[179] and the Pacific Northwest Electric Power Planning and Conservation Act of 1980.[180] Collectively, these statutes form the basis for Bonneville's authority to market power and prescribe the Administrator's obligation to give preference and priority to public body and cooperative customers over non-preference entities (investor-owned utilities and direct service industrial customers) when there are competing requests for power.[181] After meeting the needs of Bonneville's regional power customers (preference entities, federal agencies, investor-owned utilities, and direct service industrial customers), Bonneville, on a discretionary basis, is authorized to sell power as available to other entities both in and out of the Pacific Northwest

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[177] *See* 16 U.S.C. §§ 832 *et seq.*
[178] *See* 16 U.S.C. §§ 837 *et seq.*
[179] *See* 16 U.S.C. §§ 838 *et seq.*
[180] *See* 16 U.S.C. §§ 839 *et seq*.
[181] *See, e.g.,* 16 U.S.C. § 832c(a):

> In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and cooperatives.

See also 16 U.S.C. § 839c(a) ("All power sales under this chapter shall be subject at all times to the preference and priority provisions of the Bonneville Project Act of 1937 . . . ."). *See also Aluminum Co. of Am. v. Cent. Lincoln Peoples' Util. Dist.*, 467 U.S. 380, 393 (1984) ("But the preference system merely determines the priority of different customers when the Administrator receives 'conflicting or competing' applications for power that the Administrator is authorized to allocate administratively.").

BPA-2020-00784-F 0008

region.[182] As such, Bonneville meets its obligation to give public and regional preference as directed by statute.

Bonneville's proposal to join the EIM is consistent with the provisions of law relating to public and regional preference. The EIM is a voluntary market and Bonneville is not required to bid in federal generation. If there are competing applications from eligible customers for Bonneville's power, Bonneville will follow the statutorily prescribed order of sales, giving applicable preference to public bodies and cooperatives, then regional customers, and finally to out-of-region purchasers. The EIM does not change Bonneville's statutory marketing paradigm.

Surplus

Bonneville has historically sold federal power on a long-term basis to regional power customers to serve their retail load requirements on a firm and continuous basis.[183] This type of power is known as firm power. Pursuant to section 5(f) of the Northwest Power Act, federal power remaining after Bonneville has met all of its section 5(b), (c), and (d) power obligations, may be sold as "surplus" power.[184] As with other sales of power from the federal system, Bonneville is required to give preference and priority to public body and cooperative (preference) customers when it offers to sell surplus power.[185] If no preference customers request Bonneville's surplus power, Bonneville may sell that power to a regional non-preference customer.[186] Similarly, if no regional customer purchases the

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[182] *See* 16 U.S.C. § 837a; 16 U.S.C. 839c(f); *Aluminum Co. of Am. v. Bonneville Power Admin.*, 903 F.2d 585, 588 (9th Cir. 1990).

[183] *See* Committee report on energy and natural resources, H. R. No. 96-272, 96th Cong. 1st Sess. at 26 (July 30, 1979).

[184] 16 U.S.C. § 839c(f).

[185] Preference applies to the sale of surplus. Section 5(a) of the Northwest Power Act, 16 U.S.C. § 839c(a), states:

> *All power sales* under this chapter shall be subject at all times to the preference and priority provisions of the Bonneville Project Act of 1937 (16 U.S.C. 832 and following) and, in particular, sections 4 and 5 thereof [16 U.S.C. 832c and 832d].

(Emphasis added.)

[186] Section 9(c) of the Northwest Power Act, 16 U.S.C § 839f(c), states:

> In applying such sections for the purposes of this subsection, the term "surplus energy" shall mean electric energy for which there is no market in the Pacific Northwest at any rate established for the disposition of such energy, and the term "surplus peaking capacity" shall mean electric peaking capacity for which there is no demand in the Pacific Northwest at the rate established for the disposition of such capacity.

See also § 1(c)-(d) of the Preference Act, 16 U.S.C. § 837(c)-(d):

> "Surplus energy" means electric energy generated at federal hydroelectric plants in the Pacific Northwest which would otherwise be wasted because of the lack of a market therefor in the Pacific Northwest at any established rate.

BPA-2020-00784-F 0008

surplus power, Bonneville may then sell such power to out-of-region entities on a preference basis, after meeting certain conditions.[187]

For the reasons set forth in this ROD, Bonneville believes the EIM is likely to bolster its ability to fulfill its obligations to meet its regional customers' firm power requirements consistent with its statutes and its customers' contracts. As noted above, the EIM is a voluntary market, meaning Bonneville will determine, each hour, whether and to what extent it will bid any remaining federal capability (after all existing contractual and statutory obligations have been met) into the EIM for economic dispatch. If federal generation is dispatched in response to the EIM, the resulting energy could be used to serve either in region or out of region imbalance. As such, to satisfy the notice requirements of offering to sell surplus power out of region, Bonneville will update its regional notice of available surplus to include provisions regarding Bonneville's potential sales in the EIM.

Issue 3.2.3.1

Whether joining the EIM is consistent with preference and surplus requirements.

Commenters' Positions

NRU, PPC, and WPAG contend that, while it is likely possible Bonneville can meet its preference and surplus statutory obligations, additional exploration on how Bonneville will meet these requirements in the EIM is needed.[188]

Evaluation of Positions

NRU notes that Bonneville's compliance with its preference statutory obligations is of the "utmost importance" to Bonneville's power customers.[189] While NRU does not see any barriers to Bonneville signing the Implementation Agreement, NRU requests that

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"Surplus peaking capacity" means electric peaking capacity at federal hydroelectric plants in the Pacific Northwest for which there is no demand in the Pacific Northwest at any established rate.

[187] The conditions include:

(1) Bonneville must notify Northwest customers of its intent to sell surplus energy out of region (and allow review of draft agreements if requested);

(2) the sales contract must contain a 60 day notice of termination and recall for energy sales if needed to serve regional energy need; and

(3) the contract must contain a 60 month notice of termination and recall for capacity sales.

See 16 U.S.C. §§ 837a, 837b(a), (c).

[188] NRU Comments at 8; PPC Comments at 4-5; WPAG Comments at 6.

[189] NRU Comments at 8.

BPA-2020-00784-F 0008

Bonneville work with stakeholders to help them better understand the implications of the EIM on Bonneville's obligations, particularly with regard to preference to federal power.[190]

In the Proposal, Bonneville explained that the statutory framework of public and regional preference is compatible with the EIM because the EIM is a "voluntary" market. This makes Bonneville's decision to join the EIM different from the kind of decisions that typically implicate Bonneville's preference or surplus statutory obligations. For example, a short- or long-term power sale would commit Bonneville to sell energy or capacity to a specific entity for an identified amount and period. In that instance, the federal supply of energy would be diminished, and the statutory restrictions regarding public and regional preference noted by NRU and others would be triggered.

The EIM provides Bonneville with an opportunity to sell additional energy, but it includes no obligation to do so. Thus, the decision to join the EIM does not, in and of itself, impair Bonneville from giving preference or its ability to offer surplus. Bonneville's position is that, before it offers additional capacity for sale into the EIM, it will follow its statutory obligations, including the preference and surplus requirements.

NRU notes that while it "trusts" Bonneville's intention to follow its statutory requirements, it remains unclear how Bonneville will actually do this.[191] Specifically, NRU asks how Bonneville will ensure it meets its obligation to offer surplus energy first to its preference customers, and then to regional customers, before selling out-of-region.[192] NRU notes that the EIM is a real-time market that dispatches energy in fifteen and five minute intervals. NRU contends that since the EIM will dispatch Bonneville's generation at the most economical price, it is likely there would be a willing buyer within the Pacific Northwest that would want to procure the power Bonneville offers into the EIM.[193] In light of this, NRU queries how Bonneville will provide notice to preference and other regional customers of its offer to sell such energy at any established rate prior to it being dispatched in the EIM.[194] NRU notes that the only explanation Bonneville offered on providing such notice was a reference to updating its regional notice of available surplus to include provisions regarding Bonneville's potential sales in the EIM. NRU contends this description is insufficient and requests additional discussion with stakeholders on the mechanics of

[190] *Id.*
[191] *Id.* at 9-10.
[192] *Id.*
[193] *Id.* at 9.
[194] *Id.*

BPA-2020-00784-F 0008

how Bonneville will comply with these statutory requirements.[195] PPC raises a similar point in its comments.[196]

Bonneville agrees that additional discussion on the mechanics is appropriate and intends to address this issue more fully with stakeholders in other forums. However, Bonneville does not agree that it must defer its determination on its legal authority to join the EIM until Phase V. While NRU, PPC, and WPAG question the mechanics of how Bonneville will implement its preference and surplus statutory requirements, no stakeholder states that Bonneville is prohibited by its preference and surplus provisions from joining the EIM.[197] Indeed, Bonneville has found no such prohibition. Where these stakeholders differ from Bonneville is in their view that all implementation decisions must be addressed before Bonneville can conclude it has the legal authority to proceed with joining the EIM. As noted in the section addressing finality, section 2, Bonneville does not agree that all implementation details must be finally decided before Bonneville can conclude that joining the EIM is compatible with its statutory obligations.

On the specific mechanics of the notice, Bonneville intends to generally continue the regional notice format the agency has used for over 20 years. Since the advent of modern markets, Bonneville has provided notice to its preference customers regarding the availability of short-term surplus power using a combination of: (1) annual letters providing notice of surplus availability and how regional customers can exercise their rights; (2) product-specific letters/emails when Bonneville is preparing to sell a new type of product to a non-preference customer; and (3) a standing daily notification on Bonneville's website regarding the availability of surplus and instructing regional customers on how to obtain it if they are interested. Bonneville is unaware of any instance during the past 20 years where regional preference customers took issue with the format of Bonneville's notice requirements. The regional and daily notice format has been an efficient and effective way for Bonneville to participate in the short-term market while also notifying regional customers that Bonneville may have surplus power available for sale on a daily basis.

Joining the EIM will not fundamentally change Bonneville's marketing activities. Instead, the EIM provides new opportunities to continue optimizing the value of Bonneville's power. That optimization begins weeks, if not months, ahead of each hour, continues into the day-ahead market, and is finalized in the hour-ahead markets. The EIM will continue

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[195] *Id.* at 10.
[196] PPC Comments at 4-5.
[197] NRU Comments at 10; PPC Comments at 4-5; WPAG Comments at 6.

BPA-2020-00784-F 0008

that maximization of value through the hour by allowing additional dispatches of federal generation in five minute increments. Because Bonneville's current notice paradigm has been sufficient to notify regional customers of its weekly, daily, and hourly sales of surplus, Bonneville believes this method could also be used to notify regional customers of its sales in the EIM.

Nonetheless, Bonneville is open to hearing other ways of achieving the same notice objectives. In discussing this issue with stakeholders, it should be noted that the question is not whether Bonneville can meet its preference and surplus statutory requirements in the EIM, but how. Bonneville concludes through this ROD that the EIM does not require Bonneville to take any action that would be incompatible with its legal authorities to provide preference to federal power.

WPAG suggests a number of additional factors Bonneville should consider in its implementation discussion with stakeholders.[198] Specifically, WPAG says Bonneville should consider such factors as:

> (i) how and when BPA will initially earmark power to bid into the EIM, (ii) how and when preference customers can lay claim to such power before it is actually bid into the market, and (iii) the interplay between the timelines for preference customers to exercise their statutory rights with the resource sufficiency and bid related timelines under the EIM's market rules.[199]

Bonneville appreciates the questions WPAG has raised and agrees that in the discussion on providing customers with appropriate notice, WPAG's questions should be addressed. WPAG specifically asks that these issues be added as a Phase III issue. Bonneville does not agree that this specific issue need be decided through the Phase III process, but will commit to more fully discuss Bonneville's proposed notice paradigm with stakeholders.

Decision

Bonneville's participation in the EIM is consistent with the preference and surplus requirements of federal law. Bonneville is open to discussing with customers other ways of providing notice of surplus in light of EIM participation.

[198] WPAG Comments at 6.
[199] *Id.*

BPA-2020-00784-F 0008

3.2.4 System Sales

Bonneville's Position

Bonneville meets its customers' power needs from the FCRPS by selling federal power as a "system sale." Under a "system sale," Bonneville meets its power obligations by using all the electric power produced in aggregate by the FCRPS and acquired from non-federal resources. Bonneville's system sales are different than sales from other federal power marketing administrations, which market statutorily-authorized allocations of federal power on a project-by-project basis.

Bonneville's system sale model of marketing power developed as the FCRPS expanded. As each new project in the Columbia River Basin was completed, Bonneville was directed by statute or executive order to market the output of that project. In the Bonneville Project Act of 1937, Bonneville was established to market the power generated from the Corps of Engineers' newly completed Bonneville Dam.[200] Then, in 1940, Bonneville was directed to also market power from the Bureau of Reclamation's Grand Coulee Dam by Executive Order No. 8526.[201] Bonneville was directed to market power from the Corps' lower Columbia projects in the Flood Control Act of 1944,[202] and from the Lower Snake river projects in the Rivers and Harbors Act of 1945.[203] In 1951, Bonneville was directed by Secretarial Order to market power from all Corps projects "now and hereafter constructed in the drainage basin of the Columbia River and its tributaries . . . in the States of Washington and Oregon."[204] Bonneville was similarly directed by Secretarial Order to market power from all Bureau projects in the Pacific Northwest.[205] Regarding rates based on system sales, the Secretary directed Bonneville to "extend the benefits of uniform rate schedules and integrated power services to all parts of his marketing area" in a 1966 order on marketing from Snake River Basin projects.[206] Finally, in the Transmission System Act

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[200] Bonneville Project Act of 1937, § 2(a), 16 U.S.C. § 832a(a).
[201] Coordinating the Electrical Facilities of Grand Coulee Dam Project and Bonneville Project, 5 Fed. Reg. 3,390 (Aug. 29, 1940).
[202] Flood Control Act of 1944, ch. 665, § 5, 16 U.S.C. § 825s.
[203] River and Harbor Act of 1945, Pub. L. No. 79-14, § 2, 59 Stat. 10, 22 (1945).
[204] Sec. of Interior Order No. 2663, 17 Fed. Reg. 5,197 (June 7, 1952).
[205] *See* Sec. of Interior Order No. 1994, 9 Fed. Reg. 11,966 (Sept. 30, 1944) (Hungry Horse); Sec. of Interior Order No. 2115, Amendment 1, 18 Fed. Reg. 2,831-32 (May 15, 1953) (Chandler); and Sec. of Interior Order No. 2753, Amendment 1, 22 Fed. Reg. 1,090 (1957) (Roza); Sec. of Interior Order No. 2860, 27 Fed. Reg. 591-92 (Jan. 19, 1962) ("all projects now or hereafter constructed in the drainage basin of the Columbia River . . . in Washington and Oregon").
[206] Sec. of Interior Order No. 2860, amended by 27 Fed. Reg. 591-92 (Jan. 19,1962), 28 Fed. Reg. 5, 273 (May 28, 1963), 31 Fed. Reg. 13,560 (Oct. 20, 1966) (emphasis added).

BPA-2020-00784-F 0008

of 1974, Bonneville was designated as the "marketing agent" for all electric power generated by federal generating plants in the Pacific Northwest.[207]

Bonneville's system sales approach is not only a historical artifact; Bonneville adopted the system sales approach to comply with various statutory and executive directives. These directives appeared in the early marketing authorizations and were refined in the Northwest Power Act.[208] These directives fall into three general categories:

- Directives to integrate and operate the federal projects as a single system to efficiently and economically market energy;[209]

- Directives to meet the firm power load obligations of Bonneville's customers using "Federal base system resources" (note that resources is plural not singular);[210]

- Directives to recover the "total system costs" of the FCRPS.[211]

The EIM is a security constrained economic dispatch that matches loads with the least expensive generation bid into the market taking into account congestion and transmission losses. As such, a general premise of the EIM is that generation bid into the market is not from an aggregated system sale but sourced from specific locations on the integrated grid. This can be either individual generation projects or groupings of projects that are

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[207] Transmission System Act, § 8, 16 U.S.C. § 838f.

[208] Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. § 839 *et seq.*

[209] *See, e.g.,* Secretary of the Department of Interior, Harold Ickes, Senate Committee on Commerce hearings on H.R. 3961 (May 1944):

> Physical integration of the power facilities at these new projects with the existing facilities of the Bonneville Power Administration will be needed for most efficient and economical marketing of energy. At present the Administration maintains a network of high-voltage transmission lines in Oregon and Washington over which the power generated at Bonneville and Grand Coulee Dams is sold, and with which the proposed new projects should be interconnected in order to make the best use of all available power.

[210] The Northwest Power Act, § 3(10), defines "Federal base system resources" as "(A) the Federal Columbia river Power System hydroelectric projects; (B) resources acquired by the Administrator under long-term contracts in force on December 5, 1980; and (C) resources acquired by the Administrator in an amount necessary to replace reductions in capability of the resources referred to in subparagraphs (A) and (B) of this paragraph." 16 U.S.C. § 839a(10). The Regional Preference Act, § 2, provides that "the sale, delivery, and exchange of electric energy generated at, and peaking capacity of, federal hydroelectric plants in the Pacific Northwest for use outside the Pacific Northwest shall be limited to surplus energy and surplus peaking capacity." 16 U.S.C. § 837a. This language refers to federal hydroelectric plants. Because it is in the plural form it is language that encompasses the whole, or interconnected, system of federal hydro projects.

[211] The Northwest Power Act directs the Administrator to establish rates "based upon the Administrator's total system costs" and for requirements customers to "recover the costs of that portion of the Federal base system resources needed to supply such loads. . . ." 16 U.S.C. §§ 839e(a)(2)(B), 839e(b)(1). These rate directives align with the system sale paradigm in that they direct Bonneville to set rates to recover the costs of the entire federal system, which presumes that Bonneville is using the entire system to serve its customers' loads.

BPA-2020-00784-F 0008

geographically located close to one another so as not to have significantly different impacts on the grid.

Participation in the EIM with federal generation will require specific information on the source of the federal generation being used to respond to EIM dispatches. The legal question is whether Bonneville can provide the specific system information required by the EIM and still comply with the statutory and executive directives that are the foundation for Bonneville selling power from the aggregated federal system.

Bidding into the EIM Federal Generation at Specific Projects or Group of Projects Is Consistent with Bonneville's Statutory Directives

Bonneville believes that participating in the EIM with specific projects or groups of projects is consistent with the statutory and executive directives that underlie Bonneville's sales of power from the federal system.

First, bidding federal capacity into the EIM, even on an individual project level, will not pose a risk to the integration, coordination, or efficient operation of the federal projects as a single system. Like all participants, Bonneville (in coordination with the Corps and Reclamation) will determine what capacity is available to bid into the EIM. In this way, federal control will remain over (1) coordinating and controlling the FCRPS projects to meet all federal obligations; (2) determining which projects and generating units will operate and how much flexibility is available at each project; and (3) the amount of transmission that Bonneville Power Services makes available for EIM transactions.[212]

Second, participation in the EIM with specific federal projects will not pose a risk to Bonneville's ability to meet its firm power sales obligations. These obligations will continue to be met from the collective system resources of the FCRPS. The EIM preserves this functionality by allowing Bonneville to include these aggregated obligations as part of the "base schedule"[213] that Bonneville submits to the EIM. As such, Bonneville will retain its current discretion to meet these obligations from the federal projects as a single system.

Third, bidding in capacity from specific federal projects will not impair Bonneville's ability to recover its "total system costs." Bonneville will continue to sell firm requirements power to its regional customers under long-term contracts from system resources at rates set by Bonneville's statutory directives. To the extent Bonneville makes surplus power sales into the EIM, Bonneville will be compensated by the EIM at rates consistent with the bid ranges submitted with Bonneville's dispatches. The cost and benefits of those surplus

[212] *See* section 3.5.
[213] *See* section 3.5.1.

BPA-2020-00784-F 0008

power sales will, in turn, be included in Bonneville's rates. Thus, Bonneville's ability to recover total system costs from its customers will remain.

Issue 3.2.4.1

Whether Bonneville's decision to bid generation into the EIM is consistent with its obligation to make sales from the federal system.

Commenters' Positions

NRU contends that Bonneville has not sufficiently addressed how it will comport with the system sales construct in the EIM.[214] NRU agrees with Bonneville's rationale for selling power from system resources, but sees a tension in the system sales construct and the deployment of resources within the EIM.[215] While NRU identifies no problems in Bonneville's analysis of the interplay between the system sales construct and the EIM, NRU asks that Bonneville spend more time working through the issue before making a definitive legal conclusion.[216] NRU gives the example of Bonneville's proposal for aggregating its resources into three groupings as opposed to bidding in individual resources.[217] While Bonneville provides a table identifying the operational pros and cons of each aggregation, Bonneville omits whether any of the alternatives were influenced by legal factors.[218]

NRU argues that its concerns are exacerbated by the uncertainty of how Bonneville will participate in the future. NRU points out that Bonneville calls its initial aggregation a "starting point" that may be modified in the future.[219] NRU states that there should be "some discussion" about the process Bonneville will use to modify its participation model.[220] NRU contends that because of the insufficient process or explanation of how Bonneville's proposal to bid federal generation comports with the system sales requirement, Bonneville should not make a definitive conclusion on this issue until it is further addressed in Phase III.[221]

PPC similarly comments that "more exploration" is needed to confirm the agency's conclusion that bidding capacity from the FCRPS is consistent with Bonneville's statutes. PPC specifically asks Bonneville (1) if bid curves will be submitted for each of the

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[214] NRU Comments at 11.
[215] *Id.*
[216] *Id.*
[217] *Id.*
[218] *Id.*
[219] *Id.* at 12.
[220] *Id.*
[221] *Id.*

BPA-2020-00784-F 0008

aggregated resource groups; (2) how will these bid curves be developed; and (3) how this approach is consistent with the agency's interpretation that it must provide service on a system basis.[222]

AWEC contends that the Proposal recognizes that the EIM will raise questions about Bonneville's system sales obligations.[223] AWEC recommends that Bonneville continue to analyze this issue to ensure that it complies with these obligations before joining.[224]

Evaluation of Positions

NRU, PPC, and AWEC, all request Bonneville to delay making a final decision on its finding that participation in the EIM is consistent with Bonneville's historic system sales construct.[225] These stakeholders' main concern is that Bonneville has not adequately explained how bidding in federal generation, whether aggregated into groups or completely disaggregated, could comply with the system sales construct.[226]

As explained above, Bonneville adopted its "system sale" construct to comply with specific statutory requirements. These requirements include directives to: (1) integrate and operate the federal power system as a single system to economically provide energy; (2) meet firm power load from federal resources; and (3) recover the federal system's total system costs. The key legal consideration for each of these areas in the context of the EIM is control over the operation of federal generation. That is, so long as Bonneville (in connection with its other federal partners) can choose which generators are operating and which are available for dispatch into the EIM, there is no substantive difference between how the FCRPS is operated today and how the FCRPS will be operated in the EIM.

Stakeholders request additional explanation of *how* Bonneville will comply with its system sales obligations.[227] In making this request, stakeholders did not identify which statutory component of the system sales construct they are concerned with or state why Bonneville's explanation that it will retain control over federal generation is inadequate. From an operations perspective, Bonneville does not see a difference in what it is proposing and how it operates the system today. While referring to "system sales" is useful for describing the operation of the federal system for integration, contractual, scheduling, and rate purposes, the reality is that in any given hour, Bonneville, in coordination with its federal

[222] PPC Comments at 4-5.
[223] AWEC Comments at 4.
[224] *Id.*
[225] NRU Comments at 11; PPC Comments at 4-5; AWEC Comments at 4.
[226] *Id.*
[227] *Id.*

BPA-2020-00784-F 0008

partners, chooses which resources on its system to operate to meet the next hour of demand.

Bonneville hydro operations staff must routinely choose which specific resources to run in any given hour to fulfill Bonneville's obligations. For each day, and every hour, Bonneville formulates an operation plan to meet Bonneville's power obligations with the federal system. As part of this planning process, individual dams are planned to generate at various levels in order to meet overall obligations. Incorporated into this process is the fact that the system is hydraulically connected and operations upstream affect downstream operations. Each project has a range within which it can be operated while meeting non-power requirements, such as fish spill and reservoir levels. The outcome of this daily and hourly planning process is an hourly base schedule that has hundreds of MW of flexibility built into it to provide capacity reserves required for the balancing authority area.

The key point is that the operational choices that make up Bonneville's plan for meeting its power and other obligations from the federal system are the result of the unique set of factors affecting federal operations on any given day. In responding to these factors, nothing in Bonneville's statutes directs that Bonneville meet its obligations by operating the federal power system in a particular way. Congress wisely delegated such operational details to the discretion of Bonneville and its federal partners. This is integral to Bonneville's ability to make marketing and integration decisions to meet its various obligations.

The EIM will not fundamentally change Bonneville's and its federal partners' operational ability to integrate and manage the federal system. The only difference with the EIM and today's operations is the degree to which Bonneville's operational decisions will be displayed through bids and base schedule information. That is, Bonneville's capability to move federal generation will be communicated to the CAISO through bid submissions and base schedules. While that bid submission will display detail as to the source of flexibility being offered, Bonneville and its federal partners will retain the operational ability to choose which generators operate and at what levels.

A simplified example illustrates this point.

Consider today, in the absence of the EIM, Bonneville has 1,000 MW of firm demand to meet over the next operating hour. Bonneville decides to meet this demand with 700 MW at Grand Coulee and 300 MW at McNary. Assume also that next-hour hydrological conditions indicate Bonneville can sell an additional 500 MW of surplus from these resources in real-time. Either resource could be used to supply the 500 MW, so Bonneville

BPA-2020-00784-F 0008

decides to load 250 MW at Grand Coulee and 250 MW at McNary. Assuming Bonneville was able to sell all of the available surplus, the ending dispatches would become 950 MW at Grand Coulee and 550 MW at McNary. For most marketing purposes, these "behind the scenes" decisions are largely irrelevant. Bonneville's contractual obligations call for power from its system to serve load on a firm basis and nothing else.

Assume the same facts, but now Bonneville is in the EIM. Assume also that Bonneville has disaggregated Grand Coulee and McNary into separate participating resources for EIM purposes. Substantively nothing changes. In the EIM, Bonneville chooses the base schedule for each generator. Thus, Bonneville could choose the same dispatch levels it would have used in a non-EIM context: 700 MW at Grand Coulee and 300 MW at McNary. Significantly, the EIM cannot change these dispatches. Bonneville then decides how it will use the 500 MW of surplus that is available over the next hour. Here again, Bonneville has the same choice as before: it could sell the 500 MW from McNary, from Grand Coulee, or some combination of the two. Let us assume Bonneville makes the same choice as before and loads 250 MW at Grand Coulee and 250 MW at McNary. By limiting its bid curves to 250 MW, Bonneville puts a hard cap on how much capacity from each project the EIM can use. If we assume the EIM dispatched all of the available capacity offered by Bonneville, the resulting dispatches would be the exact same as the no EIM scenario: 950 MW at Grand Coulee and 550 MW at McNary.

As the example illustrates, from an operational standpoint, there is no difference in the output of federal generation because of the EIM. Just as it does today, Bonneville will choose the limits for each federal generator and will choose which generators generate (after accounting for all non-power constraints). Because Bonneville ultimately retains this control in the EIM, the level of disaggregation for EIM purposes is largely irrelevant. Bonneville could disaggregate federal generation into two, five, or a dozen generators, and the legal and operational question would be the same: Do Bonneville and its federal partners retain control over the operations of federal generation? If the answer is "yes," then legally, there is no substantive difference. So long as Bonneville is able to choose what federal generators operate and when, Bonneville will always have the ability to reflect its system sale obligations (and indeed any of its obligations) in its EIM base schedules and bid curves.

Indeed, the need for Bonneville to retain control over the operational dispatch decisions for the hydro system is why the system sales construct is important. When Bonneville has a long-term obligation, like its Regional Dialogue Contracts, it has to have the flexibility to make hydro dispatch decisions for meeting its obligations from the projects that have

BPA-2020-00784-F 0008

available water and capacity. Participation in the EIM is just another way to market the surplus that is available after base schedules have been met with available projects.

NRU asks how Bonneville derived its particular aggregation proposal for the EIM and points to the chart in the Proposal where Bonneville identifies other potential aggregations of federal generation.[228] NRU asks if there were legal factors that influenced Bonneville's aggregation decision.[229] NRU is also concerned that Bonneville may change that aggregation in the future.[230]

All of the aggregation options are legally viable. The distinguishing features of the various options are complexity, optimal hydraulic management, and workload. The more disaggregated the resources, the greater the burden it would be on Bonneville to make bid curves that reflect operations. As discussed in the federal generation aggregation section (section 3.5.1), from an electrical standpoint the groupings proposed by Bonneville provide the most sensible initial aggregation for EIM participation. Whether Bonneville chooses to change its aggregation would be a subject that may arise after Bonneville gains experience in the EIM. While Bonneville does not expect to make such a change in the near term, Bonneville will inform customers before making additional aggregation changes.

PPC specifically asks Bonneville: (1) if bid curves will be submitted for each of the aggregated resource groups; (2) how these bid curves will be developed; and (3) how this approach is consistent with the agency's interpretation that it must provide service on a system basis.[231]

Bid curves will be developed for each aggregate resource group to the extent Bonneville offers generation from that aggregation for dispatch into the EIM. How Bonneville will develop these bid curves will be determined prior to EIM participation. While certain general principles can be shared with stakeholders, for competitiveness reasons, Bonneville does not expect to share all of its business sensitive analysis. As to PPC's final question, Bonneville believes it has addressed these concerns with the above explanation. Bonneville's system sales construct is compatible with the EIM because Bonneville can comply with the statutory requirements that underlie the system sales construct within its EIM base schedules and bid curves.

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[228] NRU Comments at 11-12.
[229] *Id.*
[230] *Id.* at 12.
[231] PPC Comments at 5.

BPA-2020-00784-F 0008

Decision

Bonneville's decision to bid generation into the EIM is consistent with its obligation to make sales from the federal system.

3.2.5 Transmission Service

Bonneville's Position

To join the EIM, Bonneville would have to make certain limited changes to the terms and conditions under which Bonneville provides transmission service to its customers. The changes needed to participate would be EIM-specific and would not fundamentally alter Bonneville's existing paradigm for providing transmission service. For example, as described in section 1.3, non-federal resources within an EIM Entity's balancing authority area can be bid into the market as Participating Resources. The EIM also requires that EIM participants submit base schedules on an hourly basis, which is based on the exchange of certain data between entities within the balancing authority area. The specific criteria to facilitate these and other EIM-specific protocols are governed by the EIM Entity's Tariff. Bonneville would consider such EIM-specific changes to the terms and conditions of its Tariff to coincide with its participation in the EIM.

Within Bonneville's broad statutory parameters, the Administrator has the authority to establish terms and conditions for transmission service, including terms and conditions that would reflect EIM membership. This authority arises under section 2(b) of the Bonneville Project Act; section 6 of the Pacific Northwest Consumer Power Preference Act of 1964; and sections 4 and 6 of the Federal Columbia River Transmission System Act.[232] In brief, these statutes authorize the Administrator to operate and build the federal transmission system as the Administrator determines is appropriate and necessary for a number of reasons, including the construction of facilities to integrate and transmit federal and non-federal power, provide service to Bonneville's customers, provide interregional transmission facilities, and maintain the stability and reliability of the federal system.[233]

Bonneville's statutes also provide the Administrator with broad authority to establish the terms and conditions of transmission service.[234] Specifically, section 2(f) of the Bonneville Project Act provides as follows:

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[232] 16 U.S.C. § 832a(b); 16 U.S.C. § 837e; 16 U.S.C. §§ 838b, 838d.
[233] *Id.*
[234] 16 U.S.C. §§ 832a(f), 839f(a).

BPA-2020-00784-F 0008

> Subject only to the provisions of this Act, the Administrator is authorized to enter into such contracts, agreements, and arrangements, including the amendment, modification, adjustment, or cancellation thereof, and the compromise or final settlement of any claim arising thereunder, and to make such expenditures, upon such terms and conditions and in such manner as he may deem necessary.[235]

This grant of contracting authority to the Administrator is based on the premise that Bonneville operates as a business, and provides Bonneville the needed discretion to function in a business-oriented manner.[236]

If Bonneville decides to join the EIM, it will revise its Tariff in accordance with the process established in the 2020 Terms and Conditions Proceeding. This process, which is set out in section 9 of Bonneville's Tariff, requires Bonneville to conduct a proceeding in accordance with section 212(i)(2)(A) of the Federal Power Act, and make a decision based on several factors enumerated in section 9(a)(1) of the Tariff.

Bonneville must also revise its transmission and ancillary and control area services rates to join the EIM. Bonneville sets rates in accordance with section 7 of the Northwest Power Act. Section 7(a), in general, directs the Administrator to establish and recover in accordance with sound business principles the cost associated with, among other things, transmission of power. In the specific, section 7(a)(2)(C) directs that transmission rates equitably allocate the costs of the federal transmission system between federal and non-federal power utilizing the system. If Bonneville decides to join the EIM, it will continue to set rates pursuant to the requirements of section 7 of the Northwest Power Act.

Issue 3.2.5.1

Whether joining the EIM is consistent with Bonneville's statutory authority to provide transmission service.

Commenters' Positions

No specific comments were submitted on this issue.

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[235] 16 U.S.C. § 832a(f).
[236] Hearing on H.R. 2690 and H.R. 2693 Before the H. Comm. on Rivers and Harbors, 79th Cong. 2 (1945) (statement of Rep. Jackson).

BPA-2020-00784-F 0008

Evaluation of Positions

Bonneville will adopt its initial evaluation of this issue.

Decision

Bonneville's participation in the EIM will be consistent with Bonneville's statutory authority to provide transmission service.

3.2.6 Contractual Commitments

Bonneville's Position

Bonneville's Power Contracts

Bonneville does not anticipate any conflicts between its participation in the EIM and its current Northwest Power Act section 5(b)(1) firm requirements power sales contracts that were offered and executed in 2011 as Regional Dialogue Contract High Water Mark (RD CHWM) contracts. The EIM is a within-hour balancing market in which Bonneville's participation would be voluntary, not mandatory, meaning that Bonneville will have the choice of whether to bid surplus power not otherwise committed to meet existing contract obligations into that market.

Bonneville's RD CHWM requirements power sales contracts are of three types: i) load following contracts, which are hour ahead prescheduled contracts for firm power to meet the hourly firm load of the customer; ii) Slice/Block contracts, which are hour ahead prescheduled contracts for calculated planned amounts of power scheduled by the customer for the upcoming hour; and iii) Block only contracts, which are hour ahead prescheduled contracts for planned fixed amounts of power scheduled by the customer for the upcoming hour. Since Bonneville's obligation is determined in the hour ahead of the delivery hour, Bonneville will have set its generation requirement to meet the total of these anticipated planned amounts of power and actual hourly demand for load following for the upcoming hour. Bonneville will ensure that it has met its contractual obligation to deliver power to its customer for the next hour before Bonneville allows the EIM to dispatch any amount of additional power available for that hour.

In addition, Bonneville will continue to maintain sufficient capability to cover any real time load excursions of its load following customers during an hour. Bonneville's Slice/Block and Block only purchasers do not have an ability to change their planned amounts of scheduled power during the hour of delivery. Bonneville's power obligation to these customers during a delivery hour is not subject to change once it has been set by the

BPA-2020-00784-F 0008

customer and Bonneville. Therefore, Bonneville's ability to meet its load obligations under the aforementioned contracts will not be affected by its bids into the EIM during an hour.

It should be noted that although Bonneville's RD CHWM contracts contain a provision on resource adequacy, that provision utilizes a multi-year long-term planning standard, and should not be confused with the resource sufficiency tests in the EIM.[237]

Bonneville's Transmission Contracts

Bonneville expects to make several EIM policy decisions through iterative stakeholder processes prior to its final decision to join the EIM. As described in section 3.2.5, implementation of these EIM policy decisions will require Bonneville to add certain EIM-related terms and conditions to its Tariff, business practices, and rates schedules, which Bonneville will consider pursuant to its statutory processes.[238] Any revised Tariff terms and conditions and rates adopted by the Administrator in these proceedings will apply to all of Bonneville's new and existing Tariff-service contracts.

With regard to Bonneville's non-Tariff service contracts (*e.g.*, legacy transmission service agreements), Bonneville has not identified any agreements that would be incompatible with Bonneville's participation in the EIM at this stage of analysis. However, Bonneville will continue to monitor its portfolio of transmission-related contracts through each EIM policy determination to evaluate whether any amendments are necessary and desired for those contracts. If Bonneville does determine that certain EIM-related amendments may be necessary and desired during the course of its EIM decision-making process, it will work with individual customers to pursue any such amendments by mutual agreement.

Issue 3.2.6.1

Whether joining the EIM is consistent with Bonneville's contractual commitments.

Commenters' Positions

Comments received from the Slice Group state that they support the specification of Base Schedule Submission Timeframes in the Implementation Agreement and the proposed modification of the market closing timeline for financially binding hourly resource plans

[237] The CAISO's resource sufficiency requirements are discussed in section 3.5.7.
[238] Bonneville will consider EIM-related Tariff revisions in accordance with section 9 of the Tariff, which requires Bonneville to conduct a proceeding in accordance with section 212(i)(2)(A) of the Federal Power Act and make a final determination in that proceeding. Bonneville will consider EIM-related rate revisions to transmission and ancillary and control area services rate schedules during the BP-22 rate proceeding, which is a proceeding conducted in accordance with section 7(i) of the Northwest Power Act.

BPA-2020-00784-F 0008

from T-40 to T-30. They believe that the modification is relevant to attaining consistency with current scheduling timelines for Slice power sales contracts. They are generally concerned that scheduling issues may create impacts upon the Slice product because not all issues may be resolved by the proposed change and the EIM market closing time is ahead of the close of Slice schedules under the RD CHWM contracts.[239]

Similarly, Seattle noted that Bonneville included a provision for the CAISO to pursue modification of the scheduling timeframe from T-40 to T-30 and asks how this would benefit customers, why Bonneville is prioritizing this specific market enhancement over other possible enhancements, and whether Bonneville's participation in the EIM is contingent on this effort moving forward.[240]

Additionally, Tacoma Power commented regarding the potential impact of Bonneville's EIM participation on its purchase of Slice and the Slice product. Tacoma stated:

> BPA is correct in its assertion that Slice contract power is "firm for the hour" and [is] not subject to changes within the hour, but the scheduling timelines for Slice are incongruent with those for committing generation flexibility into the EIM. Indeed, the timelines for bidding and submitting base schedules into the EIM are artfully complex. However, it's fairly clear that commitment of flexible generation resources into the EIM precedes commitment of hourly Slice flexibility on a scheduling timeline.
>
> BPA will need to assure Slice customers, both inside and outside its balancing authority, of its ability to meet hourly flexibility limits provided through the Slice Computer Application, as well as meet contractual scheduling obligations. It will also need to demonstrate that scheduling timelines in the EIM will not adversely impact the value of Slice with respect to customers' marketing capabilities inside and outside the EIM.
>
> In this same light, contractual obligations allow for provision of physical transmission losses from Slice. Tacoma understands that Transmission Losses, and provision thereof, will be taken up in Phase III. Any new loss provision policy must be accommodating to this obligation and reasonably manageable from an operational perspective.[241]

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[239] Slice Group Comments at 7.

[240] Seattle Comments at 3.

[241] Tacoma Comments at 1.

BPA-2020-00784-F 0008

WPUDA requests Bonneville commit that each individual preference customer will be held harmless from any potential revisions to the power sales agreement made to allow or improve Bonneville's ability to participate in the EIM.[242]

Evaluation of Positions

Bonneville received comments from three customers or customer groups regarding Bonneville's joining the EIM noting possible impacts or effects upon obligations under the customers' RD CHWM Slice and Block power sales contracts. Bonneville did not receive any comments regarding Bonneville's obligations under its RD CHWM Load Following power sales contracts and joining the EIM. Under Bonneville's RD CHWM Load Following contracts, Bonneville schedules power to meet the second to second load of its customer that is not met by the customer's own power schedule to serve its load from its nonfederal resources or nonfederal purchases for the hour. Under the RD CHWM Slice and Block power sales contracts, Bonneville provides a planned hourly scheduled amount of power to the customer as a flat hourly purchase amount, a flat block, and an amount of Slice power, which the customer can schedule from Bonneville for an upcoming hour, based on a computer simulation of the federal system.[243]

The Slice Computer Application (SCA) is a Bonneville designed water routing model of the federal system capability and is intended to be a reasonable representation of operating conditions on the federal hydro generation system and the power available to the customer for scheduling on a planned basis for the next hour.[244] The SCA incorporates the constraints that are applicable to river operations for each hour and for forward time frames so that customers face similar simulated system capabilities and constraints as Bonneville would face, under similar project configuration, in their requests for power from the federal hydro system. In order to avoid energy reduction penalties, the Slice customer must demonstrate that its simulated operation meets all the conditions imposed by the SCA for the hour. Customers are also obligated to demonstrate their simulated operation is fully feasible on a ten day horizon, at least once per day.

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[242] WPDUA Comments at 2.

[243] Under the RD CHWM Slice and Block contract, customers had an initial Slice percentage calculated based upon their section 5(b)(1) planned net requirement load calculated as an annual amount, divided into Heavy and Light Load Hours for each month of the upcoming October 1 to September 30 Fiscal Year. The initial Slice percentage could not exceed 50% of the customer's planned net requirement load amount, with the remaining 50% being met by the customer's purchase of a flat or shaped for the month Block power amount. Generally, unless a customer's net requirement load is substantially reduced, the customer's Slice percentage remains the same each year, and if needed the customer's Block purchase is adjusted.

[244] The Slice customer's purchase, which can be scheduled from the federal system, includes an amount of power from the Columbia Generating Station as well as the federal dams and other minor resources.

BPA-2020-00784-F 0008

The Slice Group and Seattle commented on the proposal to modify the EIM market closing timeline for load adjustments to proposed bids from T-40 to T-30. The Slice Group believes this change in submitting final bids will be more consistent with their scheduling of power from Bonneville under the Slice product, potentially reducing impacts on the product. Seattle wants to know how such a change would benefit Bonneville and customers and whether this change was a priority over other enhancements, and a must have for Bonneville to join the EIM. Tacoma asserts there is incongruity in the scheduling of power to Slice customers and Bonneville's committing generation by bids into the EIM. Both parties want Bonneville to have further discussions of such scheduling changes and possible impacts going forward in Bonneville's EIM deliberations.

Bonneville understands that the customers are concerned with Bonneville's submission of a base schedule to the EIM at T-40, which is before the deadline for Slice customers' hourly amounts of federal power at T-30 under the RD CHWM contract. Customers suggest that there may be a conflict between Bonneville's ability to serve load or meet the Slice customers' scheduled amounts and Bonneville making surplus power available for its EIM bids.

First, under its RD CHWM Slice and Block contract Bonneville's obligation to make power available to Slice customers represents only a portion of Bonneville's total federal system power capability on any hour. While the hour to hour capability of the system will vary widely, Bonneville limited the annual amount of the Slice product to no more than 2000 aMWs (based on critical water).[245] With some customers requesting a contract change to switch their products in Fiscal Years 2016-2018, and effective with Fiscal Year 2020, Bonneville will sell approximately 1550 aMWs (based on critical water) of Slice as firm requirements power, which is a reduced amount. To meet its Slice contract obligations Bonneville needs to utilize about 22% of its firm requirements capability.

Second, the amount of power a Slice customer is able to schedule for an hour from the federal system is based on its Slice percentage applied to a simulated federal system operation for the upcoming hour and limited by federal operating constraints, reservoir elevations, and other factors that impact estimated total federal system capability. Slice customers utilize the SCA in order to determine and request amounts of power from Bonneville. As noted above, the computer simulation of the federal system, developed and maintained by Bonneville, is continuously updated to reasonably represent operating conditions on the federal power system. In order to avoid reduction penalties, customers must demonstrate their request for power is consistent with simulated operational limits

[245] *See* Regional Dialogue Contract Policy Record of Decision at 47-49 (Oct. 31, 2008), *available at* http://www.bpa.gov/news/pubs/PastRecordsofDecision/2008/CP_ROD_Final_Version_10-31-08_web.pdf.

BPA-2020-00784-F 0008

for the next hour. Since customers' delivery limits are determined by the SCA, they are capped for each customer to their known percentage amount. Because Bonneville maintains and continuously updates limits, Bonneville has an ability to understand what amount of power its Slice customers would be able to schedule for the upcoming hour. Even though Slice schedules may not be finalized until after Bonneville submits adjustments to its base schedule into the EIM, Bonneville will have the ability to take into account the potential movement of Slice schedules into the formulation of the base schedules and Bonneville's bids. This potential movement is within a known minimum and maximum for the hour, and thus Bonneville's potential Slice obligation is able to be calculated and taken into account when formulating the base schedule and bids.

Third, Bonneville has stated that its bids into the EIM will be voluntary, meaning Bonneville does not have to bid into the EIM for any particular hour. As noted earlier in section 3.2.3, the power dispatched into the EIM will be power that is surplus to Bonneville's power sales obligations, including its Slice obligations. Going into each hour Bonneville, like it does today, will continue to take into account the variation in federal system generation used to meet Bonneville's load obligations , including under the Slice contract. While business processes and methods may be enhanced over time, Bonneville's basic system operations will continue as they have over the past eight years under the RD CHWM requirement power sales contracts with customers. Today, as previously, Bonneville sells surplus power into various markets both in and out of the Pacific Northwest region that is in excess to Bonneville's requirements power sales obligations. Bonneville's sales include within-hour, hourly, daily, weekly, and monthly sales of available surplus power, and Bonneville does not view surplus power sales from the system into an EIM as substantially different. That is, in some hours Bonneville will have surplus power available to bid into the market and on other hours Bonneville may have no power to bid, given regional load obligations and system conditions.

Tacoma asserts that Bonneville must "demonstrate that scheduling timelines in the EIM will not adversely impact the value of Slice with respect to customers' marketing capabilities inside and outside the EIM."[246] This assertion has no basis in the terms of the RD CHWM Slice and Block contracts and is fundamentally contrary to the principles adopted under the Regional Dialogue policy and supported by both Slice and non-Slice customers as guiding Bonneville's offer of the Slice product. Since inception of the Slice product, Slice customers have stated that by selling Slice on a percentage basis Bonneville reduces its hydro risk and the market risk of secondary power. There is no assurance that any Slice customer will receive value from its purchase other than the specific rights it has

[246] Tacoma Comments at 1.

BPA-2020-00784-F 0008

under their contracts, and none of those specific rights are being modified by Bonneville's EIM proposal. Tacoma's ability to obtain value from the Slice product will not change with BPA's participation in an EIM.

WPUDA requests Bonneville commit that each individual preference customer will be held harmless from any potential revisions to the power sales agreement made to allow or improve Bonneville's ability to participate in the EIM.[247] At this time, Bonneville has determined that no RD CHWM Slice and Block contract changes are needed for Bonneville to participate in the EIM.

Regarding Seattle's inquiry on whether the potential scheduling change is a priority or a must have, Bonneville has addressed this issue in the discussion of the implementation Agreement in section 4. Additionally, Tacoma stated a concern that any consideration of transmission loss returns be taken up in Phase III of the process and Bonneville agrees that Slice customers' ability to physically return losses should be discussed in that part of the process.

Decision

Bonneville finds that its participation in the EIM will not conflict with Bonneville's contractual commitments and obligations under its Regional Dialogue requirements power sales contracts, including its RD CHWM Slice and Block contracts, as described above. For Transmission contracts, Bonneville expects to make EIM-related changes to its Tariff to accommodate its EIM participation. For Tariff service contracts, such changes will be adopted pursuant to the statutory process. For non-Tariff transmission service contracts, Bonneville will seek to implement these changes via mutual agreement with individual customers. Bonneville has not identified any needed modifications to such contracts at this time.

3.2.7 FERC Jurisdiction

Bonneville's Position

The Federal Energy Regulatory Commission (FERC) has limited authority over Bonneville's marketing activities. The Federal Power Act gives FERC general jurisdiction over the transmission of electric energy in interstate commerce and wholesale sales of electric energy in interstate commerce.[248] Though FERC has general authority to regulate public utilities engaged in interstate commerce, the Federal Power Act specifically exempts

[247] WPUDA Comments at 2.
[248] 16 U.S.C. § 824(b)(1).

BPA-2020-00784-F 0008

governmental entities from FERC's general jurisdiction unless the statute specifically states otherwise.[249] As a federal power marketing administration, Bonneville falls within this exemption.

The Federal Power Act does contain specific provisions that vest FERC with limited jurisdiction over Bonneville. However, neither Bonneville's agreement to participate in the EIM via contract nor the CAISO's status as a FERC-jurisdictional market can create FERC jurisdiction over Bonneville that Congress has not granted by statute. Bonneville's participation in the EIM would be facilitated via a series of contracts between Bonneville and the CAISO, and will include changes to both entities' Tariffs. Though Bonneville's assent to the agreements that are necessary to facilitate EIM participation may implicate FERC's limited jurisdiction over Bonneville, FERC maintains these limited authorities over Bonneville irrespective of whether Bonneville participates in the EIM. Moreover, Bonneville's voluntary participation in a FERC-jurisdictional market—the CAISO and, by extension, the EIM—would not alter the scope of FERC's authority over Bonneville.[250]

Because the EIM is a FERC-jurisdictional market, the CAISO must file and seek FERC approval of its Tariff, rates, and certain contracts under sections 205 and 206 of the Federal Power Act.[251] These provisions would also capture the contracts that the CAISO and Bonneville will enter into to facilitate Bonneville's participation in the EIM. It is possible that FERC could render a decision on a CAISO filing that Bonneville finds unacceptable. For example, the CAISO could propose, and FERC could approve, a change to its Tariff or rates that is incompatible with Bonneville's statutory directives or strategic goals. If this occurs, Bonneville could remedy the situation by ceasing to participate in the market until the issue is satisfactorily resolved or it may exercise its right to withdraw from the EIM. The EIM is a voluntary market in which members have the unqualified right to withdraw without an exit fee.[252]

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[249] Section 201(f) of the FPA largely exempts Bonneville from regulation under the FPA because Bonneville is an "agency, authority, or instrumentality" of the United States. Section 201(f) states: "No provision in this subchapter shall apply to, or be deemed to include, the United States . . . or any agency, authority, or instrumentality of any one or more of the foregoing . . . unless such provision makes specific reference thereto." 16 U.S.C § 824(f).

[250] *Bonneville Power Admin. v. FERC*, 422 F.3d 908, 924 (9th Cir. 2005) (The court made clear that FERC cannot expand its statutory authority over an entity based on that entity's voluntary participation in FERC-approved markets.).

[251] 16 U.S.C. §§ 824d, 824e.

[252] See EIM Charter § 2.1, which permits EIM Entities to withdraw from the EIM prior to any action that would cause or create an exit fee.

BPA-2020-00784-F 0008

Issue 3.2.7.1

Whether Bonneville's participation in the EIM would change or expand FERC's limited authority over Bonneville.

Commenters' Positions

AWEC requested Bonneville "provide additional clarity regarding Bonneville's view of potential FERC jurisdictional issues raised by EIM participation. Most importantly, Bonneville should explain what it means by the 'limited authorities' that FERC already has over Bonneville, and why EIM participation would 'implicate FERC's limited jurisdiction.'"[253]

Evaluation of Positions

AWEC requests that Bonneville "explain what it means by the 'limited authorities' that FERC already has over BPA . . . ."[254] FERC's jurisdiction over Bonneville is "limited" in that the Federal Power Act (FPA) specifically exempts governmental entities (such as Bonneville) from FERC's general jurisdiction, unless the statute specifically states otherwise.[255] Section 201(b)(2) identifies sections of the FPA that may apply to otherwise-exempt entities.[256] In accordance with those sections, FERC already has certain authorities over Bonneville's conduct.

AWEC also requests that Bonneville explain "why EIM participation would 'implicate FERC's limited jurisdiction.'"[257] Joining the EIM would not expand FERC jurisdiction; neither FERC nor Bonneville can expand FERC's statutory authority over an entity based on

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[253] AWEC Comments at 5.
[254] *Id.*
[255] Section 201(f) of the FPA largely exempts Bonneville from regulation under the FPA because Bonneville is an "agency, authority, or instrumentality" of the United States. Section 201(f) states: "No provision in this subchapter shall apply to, or be deemed to include, the United States . . . or any agency, authority, or instrumentality of any one or more of the foregoing . . . unless such provision makes specific reference thereto." 16 U.S.C § 824(f).
[256] "Notwithstanding subsection (f), the provisions of sections 824b(a)(2), 824e(e), 824i, 824j, 824j–1, 824k, 824o, 824o–1, 824p, 824q, 824r, 824s, 824t, 824u, and 824v of this title shall apply to the entities described in such provisions, and such entities shall be subject to the jurisdiction of the Commission for purposes of carrying out such provisions and for purposes of applying the enforcement authorities of this chapter with respect to such provisions. Compliance with any order or rule of the Commission under the provisions of section 824b(a)(2), 824e(e), 824i, 824j, 824j–1, 824k, 824o, 824o–1, 824p, 824q, 824r, 824s, 824t, 824u, or 824v of this title, shall not make an electric utility or other entity subject to the jurisdiction of the Commission for any purposes other than the purposes specified in the preceding sentence." 16 U.S.C. § 824(b)(2).
[257] AWEC Comments at 5.

BPA-2020-00784-F 0008

that entity's voluntary participation in a FERC-approved market.[258] However, Bonneville could potentially take actions in connection with its participation in the EIM that might fall under FERC's existing jurisdiction. The following examples are not meant to be an exhaustive list.

For example, section 222 of the Federal Power Act prohibits Bonneville from engaging in market manipulation.[259] Engaging in market manipulation within the EIM would implicate FERC's jurisdiction in this area. Likewise, under section 220, FERC can obtain certain information in accordance with its electric market transparency rules.[260] FERC could obtain such information from Bonneville related to Bonneville's role as an EIM market participant.

Further, section 206 provides FERC with limited refund authority over short-term sales into a regulated market.[261] FERC may order refunds for such sales made by Bonneville "at rates that are higher than the highest just and reasonable rate charged by any other entity for a short-term sale of electric energy in the same geographic market for the same, or most nearly comparable, period as the sale by the Bonneville Power Administration."[262] This limited refund authority would apply to Bonneville's short-term sales into the EIM.

Importantly, joining the EIM would not grant FERC new authority to assess monetary penalties on Bonneville. FERC's jurisdiction to enforce compliance does not authorize monetary penalties against the government unless a statute unequivocally waives the federal government's sovereign immunity from monetary penalties.[263] Bonneville cannot expand FERC's statutory authority by agreeing to participate in the EIM.[264]

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[258] *Bonneville Power Admin. v. FERC,* 422 F.3d at 924.
[259] "It shall be unlawful for any entity (including an entity described in section 824(f) of this title), directly or indirectly, to use or employ, in connection with the purchase or sale of electric energy or the purchase or sale of transmission services subject to the jurisdiction of the Commission, any manipulative or deceptive device or contrivance (as those terms are used in section 78j(b) of title 15), in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of electric ratepayers." 16 U.S.C. § 824v(a).
[260] 16. U.S.C. § 824t.
[261] 16 U.S.C. § 824e(e).
[262] 16 U.S.C. § 824(e)(4)(B).
[263] *Sw. Power Admin. v. FERC,* 763 F.3d 27, 35 (D.C. Cir. 2014) (analyzing FERC's authority under section 215 of the Federal Power Act. The Court further held that section 316A "undisputedly does not authorize imposition of monetary penalties against the United States." *Id.* at 35.).
[264] *See Bonneville Power Admin. v. FERC,* 422 F.3d at 923-26 ("The fact is that FERC's regulatory authority is bound by statute, and utilities can neither waive that authority to opt in or out of FERC's jurisdiction.").

BPA-2020-00784-F 0008

Decision

Certain conduct in connection with EIM participation might fall under FERC's limited jurisdiction over Bonneville, but EIM participation would not change or expand FERC's jurisdiction.

3.2.8 Market Oversight Under the CAISO Tariff

Bonneville's Position

Bonneville has considered the effect of granting the CAISO—a nonprofit public benefit corporation organized under and pursuant to California state law—certain oversight and enforcement authority over Bonneville's participation in the EIM. As a general premise, voluntarily submitting to the authorities, oversight, and the potential for sanctions and penalties within the CAISO Tariff does not infringe on Bonneville's authority. Bonneville's participation is voluntary. If Bonneville chooses to participate, then it will be subject to the conditions of participation.

More specifically, under the CAISO Tariff, EIM participants agree to certain oversight by the CAISO Board of Governors and the EIM Governing Body, the market monitoring rules administered by the Department of Market Monitoring (DMM), and recommendations to the CAISO CEO and Board of Governors by the Market Surveillance Committee (MSC). EIM participants must comply with section 29 of the CAISO Tariff,[265] which includes rules of conduct,[266] market power mitigation procedures,[267] and other market monitoring authorities.[268] Nonetheless, Bonneville retains the flexibility to determine how its resources will participate during each interval, the ability to withdraw entirely from the EIM, and the right to appeal the CAISO's decisions. These areas are addressed below.

[265] CAISO Tariff § 29.1(b).
[266] *Id.* at § 29.37.
[267] *Id.* at § 29.39.
[268] *Id.* at § 29.38.

BPA-2020-00784-F 0008

CAISO Tariff Oversight and Enforcement Provisions

Rules of Conduct

All EIM participants are subject to the CAISO's Rules of Conduct.[269] The Rules of Conduct establish expected market behavior for participants, provide sanctions for violations, and delineate whether the CAISO or FERC administers certain rules.[270]

The CAISO administers rules regarding reporting generator availability, gaining approval for generator outages, providing accurate and timely settlement data, and providing accurate and timely responses to the CAISO's investigations and audits.[271] The CAISO may impose monetary sanctions for violations of these rules, ranging from $500 to $10,000 per violation. These sanctions vary depending on the duration, severity, and frequency of violations. EIM participants that object to the CAISO's investigations or determinations retain the right to seek review with FERC.[272]

FERC administers the rule regarding EIM participants submitting bids "from resources that are reasonably expected to be available and capable of performing at the levels specified in the [b]id."[273] The DMM reports suspected violations of this rule directly to FERC.[274]

Bonneville has reviewed the Rules of Conduct and generally agrees that they represent conduct that Bonneville would want other participants to abide by. If Bonneville disagreed with how the CAISO chose to apply its authority, Bonneville could seek review with FERC.

Market Power Mitigation

The CAISO monitors the EIM in real-time to identify and prospectively mitigate market conduct that can cause non-competitive constraints.[275] The CAISO will (1) apply real-time market power mitigation procedures to the EIM, including transfer constraints into an EIM Entity balancing authority area; (2) conduct competitive path assessments for each EIM Entity balancing authority area; (3) perform locational marginal price decomposition for

[269] *Id.* at § 29.37. Note that certain rules of conduct related to Operating Instructions are inapplicable to EIM participants. *Id.* at § 37.2.
[270] *Id.* at § 37.
[271] *Id.* at § 37.1.5.
[272] *Id.* at §§ 37.6.4, 37.8.10.
[273] *Id.* at §§ 37.1.5, 37.3.1.1.
[274] *Id.* at § 37.8.2.
[275] *Id.* at § 39.1.

BPA-2020-00784-F 0008

each EIM Entity balancing authority area; and (4) determine default energy bids for EIM Participating Resources.[276]

Ahead of each interval, the CAISO conducts transmission path assessments for each EIM Entity balancing authority area to determine whether a path is competitive or non-competitive.[277] If the CAISO finds that a transmission path is non-competitive, it will employ local market power mitigation to relieve the identified constraint. Any resource dispatched to relieve congestion on a non-competitive path is subject to the CAISO's market mitigation procedures.[278] Mitigated resources will receive the higher of either: (1) a CAISO-determined "default energy bid," which is generally pegged to a cost- or market-based reference level; or (2) a competitive proxy price, which is an estimate of what the price would be in the absence of the non-competitive constraint.[279] The CAISO may also report an EIM participant to FERC as part of its market power mitigation procedures.[280]

As explained in section 3.5.5, Bonneville has reviewed the CAISO Tariff's market power mitigation procedures and has been actively involved in the CAISO's development of a fourth default energy bid that recognizes the unique characteristics of hydro generating resources. Adding the fourth default energy bid criteria to the CAISO Tariff should alleviate Bonneville concerns regarding market power mitigation.

Other Market Oversight

The DMM is an independent market monitoring unit, as required in all organized markets.[281] The DMM identifies and advises the CAISO Board of Governors on market design flaws, potential market rule violations, and market power abuses.[282] The CAISO's definition of market violations is broad, including a CAISO Tariff violation; a violation of a FERC-approved order, rule, or regulation; market manipulation; or inappropriate dispatch that creates substantial concerns regarding unnecessary market inefficiencies.[283] If the DMM identifies a violation, it will refer alleged market violations to the CAISO or directly to FERC, depending on the nature of the violation.

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[276] *Id.* at § 29.39.
[277] *Id.* at § 39.7.2.
[278] Price Formation in Organized Wholesale Electricity Markets: Staff Analysis of Energy Offer Mitigation in RTO and ISO Markets, FERC, § 3.3 (Oct. 2014), *available at* https://www.ferc.gov/legal/staff-reports/2014/AD14-14-mitigation-rto-iso-markets.pdf.
[279] CAISO Tariff § 39.7.1.
[280] *E.g., id.* at § 39.4.
[281] *See Wholesale Competition in Regions in Organized Electric Markets,* Order No. 719, 7 FERC Stats. & Regs. ¶ 31,281 (2008).
[282] CAISO Tariff § 29.38 and Appendix P § 1.
[283] *Id.* at Appendix A.

BPA-2020-00784-F 0008

The CAISO Tariff also establishes the Market Surveillance Committee (MSC) to provide market design and monitoring advice to the CAISO.[284] The MSC submits recommendations directly to the CAISO CEO and the Board of Governors based on data collected by the CAISO and the DMM. Unlike the DMM, the MSC is comprised of external members and operates independently from the CAISO. The CAISO is required to publish MSC reports and recommendations upon the MSC's request. Further, the Tariff allows the MSC to review and comment on DMM analyses and reports.[285] The MSC can recommend that the CAISO impose sanctions and penalties for Tariff violations, but has no authority to impose punitive measures itself.

In addition, if the CAISO identifies potential market abuses that are outside of the market power mitigation procedures in section 39 of its Tariff, the CAISO can make a section 205 filing under the Federal Power Act[286] to petition FERC for authorization to apply appropriate mitigation measures.[287]

While Bonneville could be subject to these investigations, Bonneville supports independent entities with specific expertise reviewing market activity and looking for potential improvements. These provisions protect Bonneville by identifying and resolving potential bad behavior by other EIM entities. The CAISO Tariff does not give the DMM, the MSC, or the CAISO the ability to direct Bonneville's operations. Instead, they seek to ensure that the market functions properly and that all market participants follow the conditions of participation.

Conclusion

Bonneville would be subject to the terms of the CAISO Tariff applicable to the EIM and its associated market rules, if it joined the EIM. These provisions are reasonable to ensure the market functions properly. These provisions would not undermine Bonneville's ability to meet its statutory obligations, including its ability to operate its system to meet non-power requirements. Existing EIM rules do not require participants to bid a specified amount of generation into the EIM, nor does the CAISO assume control of the participants' transmission systems to facilitate EIM transfers.[288] Instead, the EIM depends on voluntary bids and the transmission capacity that participants make available to the market. This preserves Bonneville's autonomy over how it sells power and provides transmission service under its statutes. Further, Bonneville would retain the ability to withdraw from

[284] *Id.* at Appendix O.
[285] *Id.* at Appendix O § 5.
[286] 16 U.S.C. § 824d.
[287] CAISO Tariff § 39.1.
[288] See section 3.2.3 for further discussion on Bonneville's authority to sell power into the EIM.

BPA-2020-00784-F 0008

the EIM. Under section 2.1 of the EIM Charter, the EIM Governing Body cannot impose a penalty or exit fee on participants that choose to withdraw from the EIM without first providing notice to participants and allowing them to exit. Voluntary participation is fundamental to Bonneville's ability to join the EIM.

Issue 3.2.8.1

Whether Bonneville would retain the autonomy to meet its statutory obligations given that joining the EIM would require Bonneville to agree to contractual provisions giving the CAISO certain market oversight and enforcement authority.

Commenters' Positions

No specific comments were submitted on this issue.

Evaluation of Positions

Bonneville will adopt its initial assessment of this issue.

Decision

Joining the EIM would require Bonneville to agree to contractual provisions giving the CAISO certain market oversight and enforcement authority, but Bonneville would retain the autonomy to meet its statutory obligations.

3.2.9 Governance

Bonneville's Position

The current governance structure of the EIM does not present a barrier to Bonneville's participation in the EIM. However, Bonneville believes that the structure can be improved. The CAISO has initiated a public stakeholder process to review the EIM governance structure. Bonneville is actively participating in this process and will continue to advocate for a more diverse, independent, and durable EIM governance structure. Moreover, Bonneville will evaluate any future EIM governance proposals to ensure they accommodate Bonneville's status as a federal power marketing administration and do not interfere with its ability to perform its statutory and contractual obligations.

BPA-2020-00784-F 0008

EIM Governance Framework

Pursuant to Article IV of the CAISO bylaws, the CAISO Board of Governors[289] constituted the EIM through a foundational charter, which established the EIM Governing Body, its responsibilities, and procedures.[290] In general, the Charter for Energy Imbalance Market Governance (EIM Charter) lays the framework for EIM governance and tasks the EIM Governing Body with promoting, protecting, and expanding the EIM. All new EIM Governing Body members are selected by the EIM Nominating Committee—comprised of representatives from various stakeholder sectors within the EIM footprint—and approved by the existing EIM Governing Body.[291] All EIM Governing Body members must be independent of CAISO market participants and stakeholders.[292]

EIM Policy Decision-making

The EIM Charter delegates decisional authority to the EIM Governing Body over certain real-time market rules and limits the authority of the CAISO Board of Governors over such rules. As discussed in section 1.3, the EIM Charter delineates the scope of this authority based on whether the real-time market rule is EIM-specific or broadly applicable to all CAISO market participants. Specifically, the EIM Governing body has primary authority over all market rules that apply uniquely to EIM balancing authority areas.[293] The EIM Charter also limits the CAISO Board of Governors' authority to enact market rule changes that are within the EIM Governing Body's primary authority by requiring prior approval of such changes by the EIM Governing Body.[294] The CAISO Board of Governors retains authority over all other real-time market rules, but the EIM Governing Body is authorized to provide formal input to the CAISO Board of Governors on those matters.[295] With respect to substantive changes to the EIM Charter, the CAISO Board of Governors may only approve

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[289] The CAISO Board of Governors is responsible for designing and overseeing the CAISO-controlled grid. The California governor appoints and the senate confirms each board member. Amended & Restated Bylaws of CAISO, § 4.1 (Dec. 18, 2015), *available at* http://www.caiso.com/Documents/ISOCorporateBylaws_amendedandrestated_.pdf (CAISO Bylaws).
[290] *See* CAISO Bylaws, Art. IV (establishing the EIM Governing Body).
[291] EIM Charter § 1.2; *see also* Selection Policy for the EIM Governing Board Selection Policy, CAISO (rev. Nov. 28, 2016), *available at* https://www.westerneim.com/Documents/SelectionPolicy_EIMGoverningBody.pdf.
[292] EIM Charter § 1.1.2.
[293] *See also* Guidance for Handling Policy Initiatives within the Decisional Authority or Advisory Role of the EIM Governing Body, CAISO (rev. Mar. 27, 2019), *available at* https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf.
[294] EIM Charter § 2.2.
[295] *Id.*

BPA-2020-00784-F 0008

such changes after they are first presented to the EIM Governing Body for advisory input.[296]

Ideally, the EIM governance would be completely independent from the CAISO Board of Governors, which are appointed by the Governor of California, but Bonneville does not see the current EIM policy decision-making paradigm as a barrier to its participation in the EIM. As described in section 3.2.3, the EIM is a voluntary market. The EIM does not alter Bonneville's decision-making authority over the dispatch of generation or the operation of the federal transmission system. Moreover, EIM entities also retain unqualified withdrawal rights. If the EIM Governing Body and the CAISO Board of Governors approved an EIM market rule change that interfered with Bonneville's ability to meet its statutory or contractual obligations, Bonneville could cease its participation in the EIM until the matter is satisfactorily resolved or exit the market entirely.

EIM Governance Review

Section 2.2.4 of the EIM Charter directs the EIM Governing Body to initiate a public process to re-evaluate the current EIM governance structure no later than September 2020.[297] This re-evaluation of the EIM is currently underway.[298] The CAISO's most recent proposals call for the establishment of a stakeholder-comprised committee to develop a governance proposal(s) through an iterative public process, which would then be presented to the EIM Governing Body and CAISO Board of Governors for approval.[299] Bonneville has actively engaged in each successive public stakeholder process since the EIM Governing Body initiated its EIM governance review process. Bonneville plans to continue monitoring and participating in this initiative as it moves forward to ensure any future revisions to the EIM governance structure continue to respect Bonneville's federal status and do not interfere with Bonneville's ability to meet its contractual and statutory obligations.

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[296] *Id.* at § 8.
[297] *Id.* at § 2.2.4.
[298] *See* EIM Governance Review: Issue Paper and Straw Proposal, CAISO (Dec. 14, 2018), *available at* https://www.westerneim.com/Documents/IssuePaperandStrawProposal-EIMGovernanceReview.pdf.
[299] *See* EIM Governance Review: Draft Final Proposal for Formation of an EIM Governance Review Committee, CAISO (May 21, 2019), *available at* https://www.westerneim.com/Documents/StrawProposal-EnergyImbalanceMarketGovernanceReviewCommitteeFormation.pdf.

BPA-2020-00784-F 0008

Issue 3.2.9.1

Whether there are any necessary changes or desired improvements to the EIM's current governance structure.

Commenters' Positions

Several stakeholders agree that, although the current EIM governance structure is not a barrier to Bonneville joining the EIM, Bonneville should continue to seek improvements.[300]

Evaluation of Positions

Bonneville is encouraged by the broad consensus of comments in this area. No stakeholder argued that the current EIM governance structure should stop Bonneville from joining the EIM. Many stakeholders, however, support Bonneville's commitment to look for ways to improve the EIM governance structure.[301] Bonneville especially values these stakeholders' offers to collaborate in these improvement efforts.[302] Stakeholder comments echo Bonneville's themes of seeking EIM governance that is more independent from the CAISO Board of Governors,[303] and ensuring future proposals respect Bonneville's federal status and contractual and statutory obligations.[304] Comments also emphasize the need for the governance structure to include representation for the region and public power entities.[305] Bonneville agrees with these themes as areas for improvement.

To that end, Bonneville has been actively participating in the ongoing EIM governance review stakeholder process that began in December 2018. Specifically, Bonneville has provided comments on each iteration of the CAISO's Governance Review Committee Formulation straw proposal. Bonneville also served a lead role in coordinating interested parties to establish the "Pending New EIM Participants Sector" as one of six stakeholder sectors nominating Governance Review Committee members, and continued to collaborate

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[300] PPC Comments at 5; WPAG Comments at 7; NRU Comments at 7-8; Seattle Comments at 2; NWEC Comments at 2; AWEC Comments at 4.
[301] *Id.*
[302] PPC Comments at 5; NRU Comments at 8; Seattle Comments at 2.
[303] PPC Comments at 5; WPAG Comments at 7; NRU Comments at 8; Seattle Comments at 2.
[304] WPAG Comments at 7; NRU Comments at 8.
[305] NWEC Comments at 2 ("We note the ongoing participation of the EIM Body of State Regulators (BOSR) in the EIM governance process. This is especially important because all utilities in our region depend on the region-wide scope of Bonneville's transmission system and operations."); AWEC Comments at 4 ("AWEC…is keenly interested in ensuring that the region and its public power entities are properly represented."); NRU Comments at 8 ("NRU is concerned about the absence of any formal role for public power entities that would give them a direct voice to the EIM Governing Body.").

BPA-2020-00784-F 0008

with interested parties to develop and rank a list of nominees. In the time since Bonneville's Proposal was published, Bonneville's Vice President of Bulk Marketing, Suzanne Cooper has been appointed to the stakeholder-comprised Governance Review Committee to develop governance proposals to present to the EIM Governing Body and the CAISO Board of Governors. In this capacity, she will be involved in reshaping EIM governance with an eye towards the improvements identified above, including working towards ensuring greater public power representation. Bonneville will continue to coordinate with its customers and stakeholders to give a voice to the concerns identified with the current EIM governance structure.

Decision

The current EIM governance structure is not a barrier to Bonneville joining the EIM, but Bonneville will continue to seek improvements in collaboration with its customers.

3.3 Environmental Obligations

Bonneville's Proposal

Bonneville's role is to market and transmit the power generated by the FCRPS projects in accordance with Bonneville's statutory directives to meet power customer loads and provide an adequate, efficient, economical, and reliable power supply. The FCRPS operations are managed with other project purposes and system-wide operating constraints, including operations to support Endangered Species Act (ESA)-listed fish. Bonneville's power marketing services and activities, and its actual power operations to meet load obligations, are conducted consistent with applicable Biological Opinions and are within existing operating constraints and normal operating limits of FCRPS projects.

Based on its most current assessment at the time of the Proposal, Bonneville believed this Proposal was likely the type of action typically excluded from further NEPA review pursuant to U.S. Department of Energy National Environmental Policy Act (NEPA) regulations,[306] which apply to Bonneville. Bonneville has completed its NEPA process and is issuing its NEPA documentation at this time for this Proposal.

All public comments concerning NEPA compliance and/or potential environmental effects for this Proposal that Bonneville received during the stakeholder discussions were reviewed as part of this NEPA process.

[306] 42 U.S.C. § 4321, *et seq.*

BPA-2020-00784-F 0008

Issue 3.3.1

Whether there are implications for environmental obligations from signing the Implementation Agreement?

Commenters' Positions

Comments received from Mr. Charles Pace state that "the letter to the region fails to address the adverse modification to shoreline habitat that is designated as critical; for a number of ESA listed salmon [evolutionarily significant units] and steelhead [distinct population segments]. And the Appendix (page 45) mentions only NEPA compliance and, even then, indicates that it doesn't appear that NEPA documents would be required." Mr. Pace requests that the following should be part of a larger EIM analysis: "impacts of load following, power peaking and wind integration on designated critical habitat in the mainstem." However, Mr. Pace concludes that "now this is NOT to say that BPA should not participate. The key to successful participation, however, lies in development of the new market products that would allow BPA to be compensated when out of region utilities lean on BPA's system. That needs to change. But as presently constituted there is little value in bidding into the EIM as presently constituted."[307]

Additionally, comments received from Adcock stated that Bonneville should not "take any action that further increases damages to salmon. [2.(6) Northwest Power Act]."[308]

Evaluation of Positions

Consistent with NEPA, Bonneville has assessed the potential environmental effects that could result from its Proposal to enter into the EIM Implementation Agreement with the CAISO. By entering into the Implementation Agreement, Bonneville would obligate the funding for the CAISO to begin integrating Bonneville's various software, networks, and processes to enable its participation in the EIM around March 2022. As discussed elsewhere in this ROD, however, signing the Implementation Agreement would not obligate Bonneville to actually join the EIM; a final decision on whether to join the EIM would be made by Bonneville in late 2021, and appropriate additional NEPA analysis and documentation will be conducted prior to making that decision.

As such, entering into the Implementation Agreement and undertaking the activities pursuant to that agreement are not expected to result in significant environmental effects. Additionally, the agreement does not involve any new generation projects and there would

[307] Pace Comments at 1.
[308] Adcock Comments at 1.

BPA-2020-00784-F 0008

be no physical changes in the transmission system beyond the areas previously disturbed or developed. Furthermore, all generation projects would continue to be operated within normal operating limits and consistent with applicable environmental laws and regulations, Biological Opinions, and related court orders.

Regarding comments received on environmental obligations, the decision currently before Bonneville is whether to enter into the EIM Implementation Agreement, not whether to join the EIM. A final decision on whether to join the EIM is expected by Bonneville in late 2021. The proper scope of environmental obligations for consideration at this time are those related solely to entering into the EIM Implementation Agreement and undertaking the activities pursuant to that agreement.

As described above, entering into the Implementation Agreement is not expected to result in significant environmental effects. Additionally, the agreement would not involve any new generation projects, and all existing generation projects would continue to be operated within normal operating limits. Furthermore, Bonneville's power marketing services and activities and power demand changes would continue to be conducted consistent with applicable Biological Opinions and would be within existing operating constraints and normal operating limits of FCRPS projects. Accordingly, the decision to enter into the EIM Implementation Agreement is not expected to result in further increases in damages to salmon or adverse modification of shoreline habitat that are of concern to the commenters.

Decision

Bonneville has determined that the Proposal to enter into the EIM Implementation Agreement with the CAISO falls within certain classes of actions excluded from further NEPA review pursuant to U.S. Department of Energy NEPA regulations, which are applicable to Bonneville. More specifically, this Proposal falls within the following categorical exclusions identified in the Department of Energy NEPA regulations at 10 CFR §1021, Subpart D: A8 Awards of certain contracts; B4.4 Power marketing services and activities; and B4.8 Electricity transmission agreements. Bonneville has prepared a categorical exclusion determination memorandum that documents this categorical exclusion from further NEPA review, which is available at the Bonneville website:
https://www.bpa.gov/efw/Analysis/CategoricalExclusions/Pages/2019.aspx

3.4 Business Case for Joining the EIM

3.4.1 Power

Background

Since the beginning of the EIM in 2014, the CAISO has published quarterly benefit reports outlining the benefits of the EIM.[309] As of July, 2019, the reported collective gross benefits of the EIM exceeded $736 million in savings to regional EIM Entities.[310]

Bonneville recognizes that its position in the EIM will be unique. Bonneville brings to the EIM different legal mandates, a large transmission system, and a system mix almost exclusively reliant on hydro-electric power. Bonneville also acknowledges that these reports do not include the costs of joining the EIM.

To evaluate the business case of joining the EIM, Bonneville developed a cost-benefit analysis (C/B Analysis), that considers qualitative benefits and compares estimated startup and annual costs to expected annual benefits. For qualitative benefits, Bonneville considered the operational benefits of the EIM. These benefits primarily inure to the transmission system, with better congestion management, improved controls, greater state awareness, and better modeling and coordination. The C/B Analysis, which Bonneville developed with input from regional stakeholders, is provided in Attachment B to this ROD. A summary of the C/B Analysis and Bonneville's findings is provided in section 3.4 below.

Bonneville presented its initial findings at a stakeholder meeting on May 15, 2019.[311] On June 12, 2019, Bonneville presented updated analysis to stakeholders at a public meeting in response to stakeholder feedback requesting additional scenario analysis.[312] Attachment B to this ROD contains an executive summary of the benefit analysis.

Bonneville's Proposal

Joining the EIM will result in changes to the internal operations and systems for Bonneville's Power Services and Transmission Services. Because these changes are expected to occur across the business lines, Bonneville approached the cost element of the Cost Benefit Analysis from a "One Bonneville" perspective and did not attempt to assign

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[309] *See* Western Energy Imbalance Market Quarterly Benefits, *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.
[310] *Id.; see also* section 1.4 above.
[311] Materials from the meeting are available at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190515-May-15-2019-EIM-Stakeholder-Mtg.pdf.
[312] Materials from the meeting are available at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190612-June-12-2019-EIM-Stakeholder-Mtg.pdf.

BPA-2020-00784-F 0008

costs to a particular business line. To assist in developing estimates for the costs of joining the EIM, Bonneville engaged Utilicast, a consulting services firm that specializes in the energy and utilities industry. Utilicast provided Bonneville estimates for a variety of Grid Modernization projects in 2017. After determining which projects were essential for EIM participation, Bonneville reviewed and updated Utilicast's estimates to incorporate Bonneville's EIM-related knowledge. Additionally, Bonneville internally estimated ongoing costs associated with Bonneville participation.

Start-Up Costs

Start-up costs are the costs that Bonneville expects to incur in the initial period leading up to and just after joining the EIM.

As noted earlier, Bonneville is in the process of modernizing the federal power and transmission systems. Many of the upgrades and system improvements needed for that effort also support the technological or operational requirements for joining the EIM. To isolate the incremental costs of joining the EIM, Bonneville focused its cost analysis on spending that Bonneville would only undertake if Bonneville were to join the EIM. Bonneville determined the "EIM Incremental" nature of each project and made updates to initial Utilicast cost estimates where appropriate. These costs generally fall into three broad groups: infrastructure (*e.g.*, metering and AGC modernization), operations (*e.g.*, base schedule submission and bid curve development), and after-the-fact (*e.g.*, settlements). Infrastructure costs are provided as a range to reflect the uncertainty around the need for metering interchange upgrades.

Bonneville's estimated startup costs, including labor and non-labor costs, are as follows:

Startup Costs ($M)

EIM Category	Cost* ($M)	Labor	Non-Labor
Infrastructure (Metering & AGC Modernization)	$7.9-$13.3	$2.7-$8.1	$5.3
Operation (EIM Integrator, Schedule Submission, & Bid Curves)	$17.2	$9.8	$7.4
After-the-Fact (Settlements)	$4.6	$3.6	$1.0
Total	**$29.7-$35.1**	**$16.1-$21.5**	**$13.7**

Bonneville's startup costs are higher than many other entities' startup costs but commensurate with Bonneville's relative size, complexity, and existing infrastructure. It is also important to note that a portion of Bonneville's labor costs included in the startup cost

estimate are not expected to be incremental to Bonneville as a whole. CAISO implementation fees of $1.8 million are included in startup costs.

Ongoing Costs

If Bonneville joins the EIM, Bonneville would also experience certain ongoing costs. The estimates of the ongoing EIM costs have evolved as Bonneville has increased its understanding of the EIM. Bonneville subdivided ongoing costs into the same three categories as the start-up costs: infrastructure, operations, and after-the-fact. There are no ongoing costs categorized as Infrastructure because expected O&M for new systems is categorized as Operation. Operational costs include estimates of the annual internal costs to perform EIM-related functions, such as creating and submitting resource plans, staffing and developing a new EIM desk, maintaining Information Technology (IT) systems, and the costs of CAISO fees related to EIM participation. After-the-fact costs include costs of maintaining more settlements staff.

The estimated ongoing costs of the EIM are as follows:

Ongoing Costs ($M/yr)

EIM Category	Cost* ($M)
Infrastructure	$0.0
Operation (Resource Plans, EIM Desk, IT O&M, CAISO Fees)	$5.7
After-the-Fact (Settlements Staff)	$1.2
Total	**$6.9**

Overview of the Dispatch Benefit of the EIM

One of the primary benefits the EIM provides to participating entities is the functionality of dispatching generation economically. Consistent with the generator's bids and transmission constraints, the EIM provides a signal to Participating Resources to increase or decrease generation when it is economic. In this way, resources participating in the EIM are likely run by owner/operators as follows: generation increases when doing so will make more revenue for that resource, and generation decreases when it would save that resource money. This feature of the EIM is generally referred to as the "dispatch benefit."

Methodology for Determining the Dispatch Benefit

To estimate the dispatch benefits of joining the EIM, Bonneville contracted with E3, an industry-recognized expert energy consulting firm that performed EIM benefits analyses for many other current or prospective EIM participants. E3 used a PLEXOS modeling

BPA-2020-00784-F 0008

approach, which simulates day-ahead and hour-ahead dispatch, along with both the fifteen-minute and five-minute dispatches of the EIM, and explicitly quantifies the incremental dispatch benefits of EIM participation.

Using the PLEXOS model, E3 simulated dispatches of the FCRPS within Bonneville's balancing authority area under two scenarios: (1) a "Business as usual" case (BAU); and (2) an EIM case. E3 used historical data from 2016-2018, including generation and generation forecasts, load and load forecasts, interchange, and price data.

Assumptions Used in Determining Dispatch Benefit

The federal power system is unique in many respects, with specific environmental, statutory, and operational restrictions limiting its flexibility. To ensure that E3's analysis reflected feasible dispatches by the federal system, Bonneville provided a list of parameters that had to be maintained when E3 performed its analysis. Briefly, these parameters were:

1. 24-hour energy neutrality[313] relative to historical actual generation to avoid river management issues
2. System feasible min/max limits calculated by the Slice Computer Application
3. Net of regulation, EIM-dispatchable capacity limited to available INC/DEC spin capacity at Big 10 projects (to eliminate simulated unit starts/stops)
4. All other generation in Bonneville's balancing authority area is held constant in both the BAU case and the EIM case
5. Bonneville estimated Resource Sufficiency requirements

In addition, Bonneville performed additional verifications of E3's proposed dispatches to ensure that the study produced dispatches of federal generation that were feasible. Bonneville evaluated and modified E3's study for the following:

1. Verified model compliance with all constraints
2. Reviewed simulated dispatch to ensure reasonableness
3. Verified simulated EIM net sales positions are within available transmission expectations
4. Reviewed initial sensitivities (50% volatility & no CA deliveries) and resulting effects
5. Confirmed that historical spin capability was sufficient to pass EIM RS requirements the vast majority of the time
6. 75% success rate applied to offset perfect foresight.[314]

[313] In this context, energy neutrality means the same level of generation over the course of a 24-hour period in both cases.

BPA-2020-00784-F 0008

Scenarios

Bonneville presented its initial findings at the May 15, 2019, stakeholder meeting. Subsequently, stakeholders requested that Bonneville perform additional analysis using different pricing assumptions. Bonneville agreed to perform additional analyses and engaged E3 to simulate Bonneville's benefits using individual pricing node scenarios. Bonneville selected the price nodes at PacifiCorp West (PACW), Puget Sound Energy (PSEI), and Portland General Electric (PGE). These price nodes display price levels and volatility experienced by actual Northwest EIM participants. Bonneville has determined that the revenue simulations using these price nodes better reflect the dispatch benefits of participating in the EIM. The resulting estimated gross benefits are summarized below.

Sensitivity Analysis

In order to test the robustness of this quantitative dispatch benefits range, Bonneville requested E3 to run its analysis using additional sensitivities based on the midpoint of scenario results (PGE or NW Midpoint/Base).

1. 50% Volatility: A reduction in market volatility that assumes lower intra-hour price volatility by 50%;[315]

2. GHG Cost Avoidance: To reflect no direct California deliveries, and avoid the GHG compliance fee, E3 modeled Bonneville receiving lower LMP when selling during intervals where marginal GHG component is nonzero;[316]

3. Flexible Ramp Sufficiency Test (FRST) Only: To reflect minimal EIM participation, E3's modeling limited Bonneville's participation to only what is necessary to meet estimated resource sufficiency requirements, based on FRST requirements, not including diversity benefit; and

4. Higher Success Rate (90%): To reflect improved foresight on market conditions, hydro constraints, operations, and success in being awarded bids at modeled price.

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[314] The E3 study produced results that assumed Bonneville had perfect market foresight (Bonneville bid range perfectly matched prices). Bonneville discounted E3's results by 25% to reflect Bonneville having imperfect knowledge of prices and thus only receiving the dispatch benefits of the EIM 75% of the time. This is not treated as a constraint, because it was an adjustment to benefits after the model completed its simulation.

[315] A larger number of EIM participants bringing both supply and demand to the market is expected to reduce observed volatility in EIM prices. A 50% reduction is not a forecast, but a scenario meant to incorporate potential lower volatility in the future.

[316] Bonneville does not currently have a procedure in place to allow delivery to CA in an EIM construct due to its inability to pay a GHG compliance fee. This scenario reflects lower market benefits associated with preventing delivery to CA. The carbon issue is explained in section 3.5.4 of this document.

BPA-2020-00784-F 0008

Summary of Dispatch Benefits

The table below shows E3's estimation of the dispatch benefit to Bonneville of joining the EIM. This table reflects the annual incremental revenue Bonneville would have received above the "business as usual" case had the EIM been in place under the operational and hydrological conditions that existed during the 2016 through 2018 period.

Gross EIM Benefits ($M/yr)

	Estimated Gross Revenue
Range of Gross Dispatch Benefits	**$36-40**
PSEI Price	$36.1
PACW Price	$40.4
PGE Price (NW Midpoint/Base)	$39.2

Gross EIM Benefits Sensitivities ($M/yr)

Reduced Volatility	$35.3
GHG Compliance	$34.6
FRST-Only Participation	$24.4
Higher Success Rate	$47.1

Comparing the costs of joining EIM with the modeled net dispatch benefits indicates significant *annual* net financial benefits to Bonneville if it participates in the EIM.

Net EIM Benefits ($M/yr)

	Estimated Net Revenue
PSEI Price	$29.2
PGE Price	$32.3
PACW Price	$33.5

Bonneville recognizes that the annual net EIM Benefits do not account for startup costs, as discussed above.

E3 modeling, paired with estimates of startup and ongoing costs, suggests that EIM participation would quickly pay for itself based solely on dispatch benefits. The sensitivities that were evaluated did not fundamentally change this conclusion.

The results of Bonneville's benefits analysis are set forth in Attachment B.

3.4.2 Transmission

Background and Context

The EIM not only produces the most economical dispatch of voluntarily-offered resources to serve load and imbalance across the entire EIM footprint,[317] it does so while simultaneously honoring all modeled constraints.[318] The EIM models numerous constraints, including transmission operating limits, balancing authority area power balance, interchange transfer limits, ramp rates of resources, minimum and maximum resource generation limits, and many others that are too numerous to list here.

The EIM produces 15-minute solutions for up to the next two hours and 5-minute solutions for up to the next hour based on a large set of input data. This includes a full state-estimated network model of the Western Interconnection, planned and forced outages, load forecasts, variable energy forecasts, economic resource offers, transmission limits, generation limits, and generation ramp rates, among many other data inputs. As such, the EIM is able to respond to not only real-time conditions but also predict future needs and operating conditions in advance.

Qualitative Transmission Benefits

The EIM can provide numerous qualitative benefits due to how the EIM works, the large amount of data it requires, and the information that it produces. Qualitative benefits categories include improved control, improved state awareness, modelling and coordination, and transmission investment decisions. Below, each category of qualitative benefits is described in more detail.

Improved Controls:

- Proactive congestion management – Transmission constraints modelled and enforced in the EIM will identify congestion before it arises and dispatch least cost resources to stay within operating limits.
- Reactive congestion management – The EIM can resolve congestion that occurs in real-time or is the result of an unplanned or forced outage within one or two 5-minute market intervals.

[317] The EIM footprint (a.k.a. EIM Area) includes all participating balancing authority areas plus the CAISO.
[318] The EIM is said to be "Security Constrained" in that it honors modeled constraints in the process of producing the most economical solution to serve load and imbalance. The combination of the economic dispatch and the security-constrained nature of the EIM are often referred to as Security-Constrained Economic Dispatch (SCED).

BPA-2020-00784-F 0008

- Proactive voltage control – The Rate of Change constraint, which helps ensure the EIM does not adversely impact voltage, would likely be more effective by including incremental dispatches from Bonneville area resources.
- Higher Transmission Utilization – With the more advanced, responsive, and forward looking congestion management capabilities of the market, there is the potential to more fully utilize existing transmission assets.

Improved State Awareness:

- Situational awareness - Leveraging the increased and more accurate data the EIM provides will allow Bonneville to create new and improved state awareness displays, allowing operators to better predict emerging operational issues.
- Access to CAISO EIM Dispatcher tools – the CAISO's Automated Dispatch System and Balancing Authority Area Operations tool will allow Bonneville Transmission to review dispatches, ensure dispatch accuracy, view Adjusted Net Scheduled Interchange, have Manual Dispatch functionality, view resource deviations, and view Bonneville binding transmission constraints.

Modeling and Coordination:

- Improved network modeling – Results in improved sharing and fidelity of critical reliability data and models.
- Improved outage coordination – Reduces the communication and coordination latency of outage information, which can result in temporary differences in modeled outages.
- Improved Power & Transmission coordination – More so than today, participating in the EIM requires tighter and more effective coordination of resource capabilities to ensure that Resource Sufficiency (RS) tests are passed and that Bonneville has reliable and economic outcomes.

Transmission Investment Decisions

The congestion management features of the EIM are expected to be more economically efficient, precise, and effective than present curtailment and bilateral redispatch capabilities. Further, through the congestion component of LMPs, over time the EIM can also help identify areas of the system that might benefit from transmission investments. This should create new opportunities for optimizing transmission expansion investment decisions as well as improve day-to-day operation of the power system. The types of projects that the EIM could help defer or avoid are the transmission expansion projects that are driven by network congestion that could be remediated with security-constrained economic dispatch. These include potentially capital intensive projects like the I-5 Corridor

BPA-2020-00784-F 0008

Reinforcement that target network flowgates with dispatchable generation on both sides. The deferral or avoidance of such projects can result in significant long-term cost savings to Bonneville transmission customers.

There are some other categories of capital projects that are driven by other needs that the EIM would not be expected to displace, such as:

- Sustain Program - These projects are needed to ensure continued safe and reliable operation of existing facilities, such as replacement of wood poles or transformers that have reached their end of life use.
- Generation Interconnection, Line & Load Interconnection - These Expansion Program projects are driven by requests from customers that need new access to the grid, such as new wind generators or data center loads.
- Load Service Area reinforcements - These projects are required to mitigate reliability criteria violations that could lead to load loss following outages. Often there is little or no additional resource capacity to increment within the load pockets during peak load conditions. An example is the Hooper Springs project in southeast Idaho.

Transmission Curtailments

When Bonneville determines that transmission flow relief is necessary to maintain system reliability, Bonneville may curtail transmission schedules pro-rata according to NERC Curtailment priority. Curtailments are non-optimal, as more MW of schedules typically must be curtailed to attain the desired MW of flow reductions. This inefficiency can be attributed to a number of factors such as Bonneville only being able to curtail schedules where it is the Transmission Service Provider or Transmission Operator; any potential relief is highly dependent on the source and the sink of the underlying schedules. Further, curtailments result in imbalances that need to be resolved separately by each impacted balancing authority area, often further reducing the effectiveness of curtailments, because each balancing authority area's resolution of the imbalance resulting from the curtailment is typically not informed by Bonneville's transmission constraints.

The EIM's security-constrained economic dispatch (SCED) model is able to find an optimal redispatch solution of voluntarily offered resources that can simultaneously minimize costs while taking into consideration transmission constraints and operating limits. Price signals and market dispatches incentivize effective resources to be dispatched (incremental or decremental) to manage the congestion in the most cost effective manner possible while simultaneously ensuring each EIM participating balancing authority area remains balanced. Since any effective and economic EIM Participating Resource can potentially fulfill the

BPA-2020-00784-F 0008

market dispatches, the EIM has the potential of reducing the burden on Bonneville transmission customers and reduce the likelihood of curtailments or scheduling restrictions.[319]

As an example of the ability of the EIM to provide moderate amounts of flow relief, Bonneville tested the EIM Area Total Flow (ETF) constraint that was created as part of the Bonneville-CAISO Coordinated Transmission Agreement (CTA).[320] Bonneville compared the effectiveness of the EIM to provide flow reductions versus traditional schedule curtailments. The ETF constraint was able to provide in one 5-minute market run an amount of flow relief that would have required over 1,200 MW of schedule curtailments.

EIM as a Non-Wires Solution

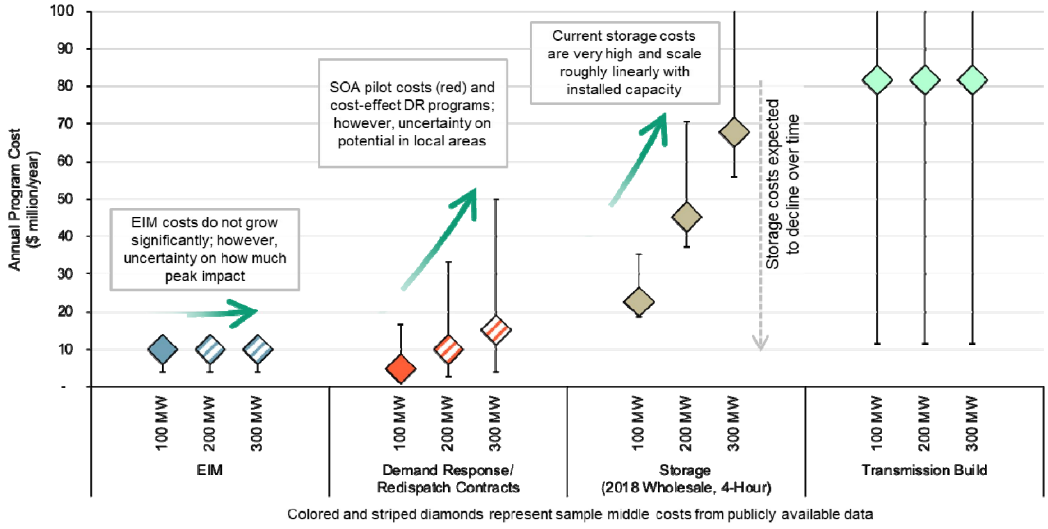
The EIM has characteristics that Bonneville believes could be used as a cost effective alternative for managing moderate amounts of intra-hour congestion across the transmission system. These characteristics are akin to Bonneville's use of non-wires solutions to address congestion. The characteristics of the EIM compared to demand response (DR), storage, and transmission builds are shown in the table below.

	EIM	DR	Storage	Transmission Build
Generation Capacity Value	No	Yes	Yes	No
Energy Value	Yes	Yes	Yes	No
Transmission Capacity Value	Low	Low	Medium	High
Congestion Area	Wide	Local	Local	Local
Congestion Value	High	Medium	Medium	High
Effort to Provision	Low	Medium	Medium	High
Levelized Costs	$	$$	$$$	$$
Call Option Timing	N/A	0-2 Days	0-2 Days	N/A
Response Time	8-12 Minutes	0-18 Hours	0-18 Hours	N/A
Duration	5-240 Minutes	1-360 Minutes	1-480 Minutes	30-50 Years
Uses	Load Service Imbalance Energy Economic Dispatch Congestion Management Renewable Integration Energy Optimization	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services Energy Optimization	Load Service Renewable Integration

[319] Transmission rights remain unchanged by the EIM.
[320] The CTA is available at https://www.bpa.gov/transmission/CustomerInvolvement/CoordinatedTransmissionAgreement/.

Bonneville will continue to invest in transmission builds, DR, and storage as part of Bonneville's resource planning and load service strategies.[321] However, the EIM can provide Bonneville an additional tool to help manage intra-hour congestion across a wide area (*e.g.*, multiple constraints or locations) with minimal incremental costs, whereas other solutions are typically a locational solution and applicable to only portions of the system. For example, additional locational investments in DR, storage, or transmission builds would potentially be required to manage flows across multiple wide area constraints. All of these types of solutions will still be necessary if Bonneville joins the EIM, but Bonneville would be able to incorporate less expensive and simpler redispatch options in certain situations that may be very difficult or cost prohibitive for Bonneville to achieve outside of joining the EIM.

The figure below shows conceptually how the EIM costs[322] do not grow significantly as flow relief needs increase (100 MW, 200 MW, 300 MW), although uncertainty on how much flow relief is available increases with need. For illustrative comparison, utilizing DR or storage would require additional investments as more flow relief is needed or additional areas of the system need flow management.[323]



[321] The EIM does not provide any energy capacity or transmission capacity value and cannot be relied upon to meet hourly resource sufficiency or long-term resource adequacy needs. Investments in resources and transmission assets with true capacity value will still be necessary.

[322] EIM costs are illustratively shown as annual levelized program costs based on Bonneville's estimated startup and ongoing costs spread over 20 years at an 8% discount rate to be roughly $10 million/year.

[323] Comparison costs depict up-front implementation costs, not levelized or discounted over the anticipated life of the solution. Bonneville expects that the levelized costs of an ongoing DR program would be significantly less than those from the time-limited SOA pilot. While the cost of storage solutions has rapidly declined in recent years, with further cost reductions expected, figures shown here may not represent near-horizon costs for battery storage.

BPA-2020-00784-F 0008

Illustrative Quantitative Example

Accurately and objectively quantifying EIM transmission benefits is challenging given the multi-faceted nature of the EIM and that Bonneville will have many options that must be considered and evaluated when making future investments in solutions to address operational and reliability needs.[324] However, it is useful to compare an illustrative quantitative scenario made possible by joining the EIM to one or more non-wires scenarios.

Assuming two flowgates, each needing 100 MW of intra-hour flow relief, one can develop an illustrative quantitative example as follows:

- Battery and Redispatch Scenario: Assume that the relief comes from a 50/50 mix of battery storage and Redispatch contracts or DR
  - Assume Redispatch/DR costs based on South of Allston (SOA) Redispatch Pilot[325]
- EIM: Based on total levelized EIM program costs

As shown below, the annual costs would be $27.6 million/year in the Battery and Redispatch scenario and $10 million/year in the EIM case. The annual program costs for the Battery and Redispatch scenario would be expected to increase if more relief is needed or more flowgates need to be managed, whereas the EIM costs would likely not grow significantly. For example, as a sensitivity, if you changed the base scenario to 4 flowgates or 200 MW, the annual program costs would be $55.2 million/year in the Battery and Redispatch scenario and $10 million/year in the EIM case.

Battery and Redispatch Scenario		EIM Case	
100 MW battery @ $226/kW-year	$22.6 million/year	$10 million/year (levelized startup and ongoing costs)	$10 million/year
100 MW Redispatch Contract / DR @ $50/kW-year	+ $5.0 million/year		
Annual Cost	**= $27.6 million/year**		**= $10 million/year**

[324] DR, storage, and transmission builds have unique purposes and value outside of congestion management.
[325] The SOA Redispatch Pilot provided for approximately 100 MW of flow relief for 40 hours/year *(10 events, 4 hours each, weekdays afternoons only, from July-September, 2017 and 2018)* from 200 MW of incremental and 200 MW of decremental capacity with a prior to pre-schedule call-option requirement and manual deployments. A longer-term program may have been less expensive on an annual basis (*e.g.*, 5-7 years).

BPA-2020-00784-F 0008

Transmission Benefits Summary

The EIM has characteristics that Bonneville believes provide many qualitative transmission benefits and is an additional tool for Bonneville to use for grid management. Further, Bonneville's transmission customers in its balancing authority area may also benefit by being able to bid their resource flexibility into the EIM, allowing them an additional opportunity to optimize their energy dispatch and maximize the value of their resources.

The EIM not only provides the most economic dispatch solution to supply load and imbalance in the balancing authority area, it can also provide a more precise, effective, and cost efficient mechanism to manage moderate amounts of intra-hour congestion. While the EIM does not create new capacity or replace the need for investments in transmission, DR, or storage, it is a complementary low cost alternative (among other non-wires options as well as new transmission builds) for addressing modest intra-hour transmission relief needs that arise across the Bonneville system.

Issue 3.4.1

Whether the business case presented in the Proposal is sufficient to support Bonneville's decision that joining the EIM is a sound business decision.

Commenters' Positions

Several commenters agree that Bonneville's decision to join the EIM is a sound business decision supported by a robust business case. Governor Inslee agrees that the "market benefits study makes clear that joining the EIM will contribute to improving the efficiency of the power and transmission operations [the FCRPS] and allow BPA to increase opportunities for, and revenues from, marketing the power from the federal system's hydroelectric dams."[326] NRDC makes a similar comment, noting that the benefits of joining the EIM are "not hypothetical," and that the EIM has been shown to "create[] positive benefits regardless of the business model of its participating members."[327] Renewable Northwest supports Bonneville signing the Implementation Agreement and the prospect of Bonneville joining the EIM because of the "wide array of quantitative and qualitative benefits that Bonneville identifies in its Proposal."[328] Renewable Northwest agrees with Bonneville's assessment that the modeled benefits of the EIM (over $33.5 million in annual net benefits) would quickly pay for itself.[329] AWEA contends that Bonneville's analysis

[326] Governor Inslee Comments at 1.
[327] NRDC Comments 1-2.
[328] Renewable Northwest Comments at 2.
[329] *Id.*

BPA-2020-00784-F 0008

"clearly demonstrate[s] that, on the whole, BPA and its customers are expected to achieve substantial net benefits from EIM participation" and may, in fact, "be conservative."[330]

Other stakeholders support Bonneville joining the EIM, stating that the EIM has provided large benefits to other utilities. Chair Decker and Director Benner note that the OPUC "determined that joining the EIM was likely to result in cost savings for customers" and that the CAISO estimates that PacifiCorp, PGE, and IPC customers have received tens of millions in gross benefits.[331]

Renewable Northwest also agrees that joining the EIM would provide Bonneville important qualitative transmission benefits like "the ability to better manage transmission congestion and the potential of utilizing existing transmission more efficiently," which could defer or avoid transmission expansion projects driven by network congestion.[332] Renewable Northwest highlights in its comment the potential transmission benefits of joining the EIM, such as reduced curtailments or scheduling restrictions.[333]

The Bonneville Environmental Foundation acknowledges the significant work Bonneville has done to evaluate the EIM benefits and notes that the "initial results show that the region could benefit greatly from BPA's participation [in the EIM]."[334]

A number of stakeholders comment that Bonneville's business case is sufficient to sign the Implementation Agreement, but should not be considered final for purposes of deciding whether to join the EIM.[335] Instead, these stakeholders ask Bonneville to "refresh" its business case analysis in Phase V, as Bonneville considers whether joining the EIM is consistent with its stated principles (one such principle is that Bonneville's decision to participate in the EIM must be based on a sound business rationale).

WPUDA expresses concern that the EIM market design may result in Bonneville resources being "undercompensated for the value they provide" and requests Bonneville consider whether the "inherent design" of the EIM undervalues Bonneville's resources if they are bid into the market and, if so, whether participation meets "the standard of sound business principles."[336]

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[330] AWEA Comments at 1.
[331] OPUC/ODOE Comments at 1.
[332] Renewable Northwest Comments at 2.
[333] *Id.*
[334] Bonneville Environmental Foundation Comments at 1.
[335] AWEC Comments at 4; Seattle Comments at 2; Clatskanie Comments at 2; PNGC Comments at 1-2; PPC Comments at 5-7; WPAG Comments at 7; Slice Group Comments at 5; NRU Comments at 2, 4-5.
[336] WPUDA Comments at 3-4.

BPA-2020-00784-F 0008

Commenter Mr. Pace (representing himself) contends that Bonneville's "[f]ailure to [address shoreline habitat modification] invites litigation in the 9th Cir[cuit], as well as implicates FERC jurisdiction. "[337] He argues that the risk of litigation is not worth the "paltry return of about $30 million."[338] While not disagreeing with Bonneville's decision to participate, Mr. Pace argues that Bonneville should develop new market products that would allow Bonneville to be compensated when out of region utilities lean on Bonneville's system. Mr. Pace contends there is "little value" in bidding in the EIM as presently constituted.[339]

Evaluation of Positions

Bonneville's business case supports an agency decision to participate in the EIM. This business case demonstrates substantial overall benefits to Bonneville and its customers through EIM participation, both from a quantitative and a qualitative perspective. As described in section 2, this business case is one of the decisions Bonneville has described as "final."

Many commenters agree that Bonneville's business case supports signing the Implementation Agreement and joining the EIM. However, other commenters only agree that it supports signing the Implementation Agreement. They contend that Bonneville's business case analysis is insufficient to support full EIM participation. These commenters argue that Bonneville can only determine whether joining the EIM is a sound business decision during Phase V, after Bonneville "refreshes" its business case analysis with updated information.

Bonneville has already addressed commenters' primary arguments on the finality of its business case decisions in section 2 of this ROD. As discussed earlier, Bonneville will update the business case for any significant changes to the facts underlying Bonneville's analysis. However, barring any significant changes, Bonneville's present business case analysis is sufficient to find that joining the EIM is a sound business decision.

Although commenters identify various areas where they believe additional information could help Bonneville's analysis, they have not identified any critical flaws in the business case or explained why Bonneville's decision is unreasonable. Bonneville's response to commenters' specific issues with the business case analysis is described in more detail below under the topical headings.

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[337] Pace Comments at 1.
[338] *Id.*
[339] *Id.*

BPA-2020-00784-F 0008

Clatskanie's Four Factors

Clatskanie argues that Bonneville does not have sufficient information at this point to state whether joining the EIM is a sound business decision.[340] Clatskanie argues Bonneville should revisit the business case in Phase V and, when doing so, consider four additional factors:

1. The costs and benefits of joining the EIM that BPA can reasonably be expected to realize—as finalized after the policy decisions are implemented;

2. An evaluation of the implications of joining on BPA's operations and business model, including the implications of joining on the products and services BPA provides under its long-term contracts;

3. Consideration of any asymmetric harm participation may have on customer groups based on their products, services, or geographic location; and

4. Consideration of whether participation is consistent with the Tiered Rate Methodology and with continuing to offer (including post-2028) the products and services established in the Regional Dialogue Contracts.[341]

Bonneville disagrees that its business case is insufficient or that it must wait until Phase V to make a final decision (absent significant changes). In particular, Clatskanie's four factors have already been addressed by Bonneville's current business case and legal analysis, will be addressed in other phases, or are independent from the business case justification.

Factor 1 has already been addressed. The $29-$34 million in Bonneville's business case reflects EIM benefits from the historic period of 2016-2018. This analysis provides a sound basis to expect that joining the EIM will produce net benefits to Bonneville. Indeed, for the reasons articulated in the business case analysis, this is likely a conservative estimate of these benefits in that Bonneville constrained several aspects of the EIM to limit economic dispatches. How much of that benefit will actually be realized is uncertain, and waiting until Phase V for additional information will not change that outcome.

Clatskanie's second factor—impacts on Bonneville's operations and business model—has also been addressed, albeit not in Bonneville's business case assessment. As described in

[340] Clatskanie Comments at 2.
[341] *Id.*

BPA-2020-00784-F 0008

the finality section and the legal analysis, Bonneville has assessed, and will continue to assess, the impacts of the EIM on Bonneville's contractual and operational obligations.

The cost allocation details of Clatskanie's third factor, except for the geographic location, will be addressed in Phases III and IV, and are not directly related to Bonneville's business case. As for Clatskanie's fourth factor, the EIM should have no impact on the Tiered Rates Methodology, which is applied on an annual basis and is not affected by Bonneville's real-time surplus marketing decisions. In addition, Bonneville has already determined in section 3.2.6 that EIM participation is consistent with Bonneville's contractual obligations. As to Clatskanie's comment that Bonneville must consider the impact of the EIM on future Bonneville products, Bonneville does not intend to speculate about what products it may offer post 2028 in this EIM decision process.

Also, more generally, the third and fourth factors relate to the effects of the EIM on individual customer groups. While those issues certainly must be addressed to ensure the costs and benefits of the EIM are properly allocated, the outcome of that process would not change the overall net benefit of the EIM to Bonneville as an agency which will ultimately inure to Bonneville's customers. Congress directed that Bonneville decide what is in its business interest. Bonneville views its business interest as aligned with its customers. As Bonneville's business interest is furthered, so too are its customers' business interests through lower rates, more competitive products, and greater reliability. This follows from the non-profit nature of Bonneville's business. If Bonneville achieves a net benefit, that benefit is not retained but passed along to customers. Thus, Bonneville does believe evaluating the EIM from the perspective of different customer groups is necessary because the benefits of the EIM will ultimately be passed along to individual customer groups through lower rates and more reliable services. That said, Bonneville will monitor the assumptions upon which its business case was developed and may revise the case should it determine that there are material changes to those assumptions.

Need for Cost and Benefits Rate Allocation

NRU contends that there is insufficient evidence to decide whether joining the EIM is a sound business decision.[342] In particular, NRU argues that certain decisions on how costs and benefits will be allocated between and within each business line must be addressed before Bonneville can determine whether the EIM is a sound business decision.[343] For example, NRU argues that the imbalance services provided from Power to Transmission

[342] NRU Comments at 2.
[343] *Id.* at 2, 4-5.

BPA-2020-00784-F 0008

may be impacted if Bonneville joins the EIM.[344] NRU contends that there are outstanding issues about how Power will manage and price the FCRPS for purposes of selling imbalance services to Transmission and how Transmission will set its rates for these services.[345] NRU claims that it is not possible to determine whether joining the EIM is a sound business decision until Bonneville and its customers determine the costs, risks, and benefits of allocating imbalance services.[346]

Other stakeholders raise similar concerns. AWEC raises a similar argument in its comments, noting that it cannot take a strong position on Bonneville's participation in the EIM "without fully understanding how the costs and benefits are likely to be allocated."[347]

NRU and AWEC, like Clatskanie, ask Bonneville to delay making its decision on the business case until the individual impacts of the EIM on each customer is better understood. While Bonneville appreciates these concerns, Bonneville believes that so long as the EIM is in Bonneville's business interest, then Bonneville may proceed with its decision to join the EIM. As the Ninth Circuit has repeatedly stated, the Court defers to Bonneville's decision when Bonneville "acts in furtherance of *its* business interests,"[348] especially when responding to unprecedented changes in the market.[349] The Court would not set aside Bonneville's business case evaluation unless it was unreasonable.[350] An assessment is unreasonable if it is contrary to clear congressional intent, and Congress intended to grant Bonneville an "expansive mandate to operate with a business-oriented philosophy."[351] The soundness of Bonneville's business decisions, then, depends on whether the business interests of Bonneville are promoted in the challenged action.

To be clear, Bonneville does not view its business interests as adverse to its customers. As described previously, if Bonneville's business interest is advanced, customers of Bonneville will reap the benefits of those decisions through lower rates and more reliable service.

With regard to joining the EIM, Bonneville has determined the projected business case net benefits to Bonneville could be in the range of $29-$34 million annually. Absent significant changes, that is sufficient evidence for Bonneville to conclude that the EIM is a sound

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[344] *Id.* at 5.
[345] *Id.*
[346] *Id.*
[347] AWEC Comments at 2.
[348] *Pac. Nw. Generating Co-op. v. Bonneville Power Admin.*, 596 F.3d 1065, 1075 (9th Cir. 2010) ("*PNGC*") (citing *Ass'n of Pub. Agency Customers, Inc. v. Bonneville Power Admin.*, 126 F.3d 1158, 1171 (9th Cir. 1997) ("*APAC*")) (internal quotations omitted) (emphasis added).
[349] *Bell v. Bonneville Power Admin.*, 340 F.3d 945, 949 (9th Cir. 2003); *see also PNGC*, 596 F.3d at 1065; *APAC*, 126 F.3d at 1171.
[350] *Alcoa, Inc. v. Bonneville Power Admin.*, 698 F.3d 774, 790 (9th Cir. 2012).
[351] *Alcoa, Inc.*, 698 F. 3d at 790; *APAC*, 126 F.3d at 1171 (emphasis added).

BPA-2020-00784-F 0008

business decision. NRU does not dispute this finding, but presses Bonneville to wait to make this decision until it can see Bonneville's cost and rate allocation decisions related to imbalance services between Power and Transmission customers.[352] Bonneville does not see a connection between the rate treatment of imbalance services and the business case for joining the EIM. Because Bonneville is estimating the net benefit from an agency perspective, and is not tying its decision to join the EIM to a specific allocation of benefits between Power or Transmission customers, Bonneville does not need to wait to attribute any estimated benefits between the business lines before deciding that joining the EIM is a sound business decision.

NRU's concern with Bonneville's treatment of its imbalance services and the business case justification are also misplaced. The business case benefits of the EIM are not dependent on Bonneville's imbalance service decisions in the rate case. The business case analysis took Bonneville's imbalance service values as a given from the past historic periods. The benefits resulting from the business case analysis reflect "optimization" benefits that occur while staying within the federal system's given limits and optimizing the existing flexibility to achieve greater overall value. Thus, in the case of imbalance services, the business case analysis did not alter the amount or price of that service. Bonneville expects similar independence between imbalance services and EIM operations will be reflected in future rate cases. That is, Bonneville will determine in its rate cases its need for imbalance services and price them according to its rate case methodologies. Bonneville's imbalance service decisions do not dictate Bonneville's benefits of the EIM.

Need to Refresh Business Case in Phase V with New Information

Several commenters generally contend Bonneville cannot conclude that EIM participation is a sound business decision until an updated business case is performed in Phase V. These commenters request Bonneville label its business case as "preliminary" until Bonneville refreshes it in Phase V with updated information. For example, PNGC contends that Bonneville should not make a final decision on the business case because the assessment made by E3 and Bonneville staff "will be verified during the implementation phase."[353] While encouraged by potential benefits so far described, PNGC urges Bonneville to "reserve a final decision to join the EIM until after all due diligence has been completed" and "verified at the end of BPA's proposed timeline."[354] PNGC thus requests Bonneville to "refresh" the E3 analysis prior to making its final decision to join the EIM.[355]

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[352] NRU Comments at 5.
[353] PNGC Comments at 1.
[354] *Id.*
[355] *Id.* at 2.

BPA-2020-00784-F 0008

PPC makes a similar argument. PPC encourages Bonneville to include as part of Phase V a review of its quantitative cost benefit analysis to ensure that any updated information is properly considered. PPC notes that there are "possible changes in the EIM and/or other related markets prior to BPA's final decision that may impact the expected benefits."[356] PPC further contends that until Bonneville's "scoping efforts" (including its implementation work) are finished, it is premature to draw any definitive conclusions on whether participation is a "sound business decision." PPC suggests Bonneville revise this section to make clear that the business case is not a stand-alone justification of a sound business rationale for joining the EIM, but just one piece of evidence that supports signing the Implementation Agreement and "the agency's continued interest in joining the EIM."[357]

Seattle encourages Bonneville to remain open to refreshing its quantitative cost benefit analysis "if circumstances change in BPA's assumptions or [the] participation model leading up to its final decision on participation in [the] EIM."[358]

The Slice Group supports designating the business case as "preliminary" and agrees that it demonstrates that signing the Implementation Agreement is a sound business decision.[359] However, the Slice Group urges Bonneville to wait until Phase V to make its final decision that joining the EIM is a sound business decision.

WPAG argues that waiting until Phase V to make its final decision on whether Bonneville's decision to join the EIM is a sound business decision will ensure Bonneville's decision is based on the most up to date information and facts and complete record.[360] While WPAG agrees Bonneville's benefit analysis supports signing the Implementation Agreement and doing the work identified in Phases III and IV, WPAG disagrees that it supports a finding that joining the EIM is a sound business decision. WPAG believes that decision should come in Phase V, after Bonneville evaluates whether joining the EIM is consistent with its principles, after considering "any changes to the market rules, market participation requirements, market price conditions, or any other new developments that change the business case conclusions of BPA's current analysis."[361] WPAG further argues that if Bonneville does not take into account in Phase V "any changes in facts, knowledge regarding EIM impacts on BPA and/or its customers, market design or viability, and other

[356] PPC Comments at 6.
[357] *Id.*
[358] Seattle Comments at 2.
[359] Slice Group Comments at 5.
[360] WPAG Comments at 6.
[361] *Id.* at 7.

BPA-2020-00784-F 0008

relevant new information arising after BPA executes the Implementation Agreement" Bonneville's decision would be on "unsound legal ground."[362]

AWEC urges Bonneville to refresh the business case analysis in Phase V to ensure the viability of Bonneville's decision to join. The risk, in AWEC's view, is that a final decision based on data from 2018 and 2019 would be outdated in 2021, when Bonneville actually decides to join the EIM.[363]

Bonneville disagrees that, to make a sound business decision, Bonneville must redo its business case during Phase V. Bonneville has already spent several months and hired two third party consultants (Utilicast and E3) to provide data on the costs and benefits of EIM participation. That analysis, described at length earlier, shows significant qualitative and quantitative benefits. Absent a fundamental flaw in that analysis, which no party has identified, Bonneville believes the record as it stands supports Bonneville's effort to move toward joining the EIM. Moving forward, Bonneville will be focusing on implementation details and beginning to make the investments necessary to begin EIM operations in 2022. While the ultimate decision to join still remains for Phase V, Bonneville does not believe it is required or necessary to incur the additional expense and time to develop another business case analysis after the conclusion of this process. However, consistent with Seattle's comments, Bonneville is open to reexamining the business case if there are fundamental changes in facts or market rules.

Several commenters urge Bonneville to "refresh" the business case analysis in Phase V because Bonneville will have more information at that point.[364] These commenters appear to be arguing that because the business case analysis would likely produce a different numerical result with newer information, Bonneville's decision to base its business case on current information, without an automatic refresh at the end, is "unsound."[365]

Bonneville disagrees with the comments that state Bonneville must revisit its business case in Phase V simply because more information will be available. Invariably, if Bonneville were to revise its business case with newer information, the business case would produce a different numeric result. But, the fact that the results may be "different" does not mean the current analysis is in any way "unsound." The key issue would be whether the newer information is so foundational or critical that Bonneville's finding that joining the EIM is a "sound business decision" is no longer valid. Few changes that could occur between now and Phase V would fall into this category.

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[362] *Id.* at 5.
[363] AWEC Comments at 4.
[364] WPAG Comments at 6-7, PPC Comments at 6; PNGC Comments at 1; AWEC Comments at 4.
[365] *See, e.g.,* WPAG Comments at 5.

BPA-2020-00784-F 0008

For example, assume Bonneville revisits its entire business case with updated information in Phase V and the new net annual benefit estimate becomes $50 million. This new "updated" analysis would show an even stronger economic case for supporting Bonneville's decision to join the EIM. In this instance, Bonneville would have expended the time and resources updating its analysis, thereby developing a different numeric result for its business case, but the underlying "soundness" of the business decision to join the EIM would not have changed. Similarly, assume Bonneville revised its business case in Phase V and determined that the net benefits were reduced to $20 million annually. This analysis would show that Bonneville's decision to join the EIM is supported by substantial benefits, but not as much as Bonneville's original estimate. Here again, there is no substantive difference between the two analyses for purposes of Bonneville's decision process. Making a business decision to join the EIM based on a business case with an estimated net positive benefit of $20 million is as legally sound as basing a decision to join the EIM based on an earlier estimate of $29-$34 million.[366] The numbers are different, but the soundness of the business decision has not changed.

Commenters appear to be focused on the extreme cases that could occur between now and Phase V. That is, commenters appear to fear the scenario where Bonneville would hold to a business case that projected net benefits of $29-$34 million, but because of fundamental market or factual changes, the estimated benefits would be closer to zero or even negative. In that extreme case, Bonneville would agree that holding to an outdated and clearly flawed analysis would be unsound. As described in section 2, and again in this section, Bonneville's business case would be updated if there were fundamental changes to the EIM or to the underlying facts of the business case. This raises, of course, the inevitable question as to whether a specific fact or event qualifies for a refresh of the business case. Bonneville appreciates that there may be differing views on these events and so has made it clear that stakeholders will have a voice in recommending changes to the business case in Phase V based on what they perceive to be fundamental changes. This approach ensures that fundamental changes are reviewed and considered by Bonneville before joining the EIM, as suggested by commenters, while also preserving the work that has been done and avoiding unnecessary and costly additional studies for non-essential changes between now and Phase V.

[366] *See Alcoa, Inc. v. Bonneville Power Admin.*, 698 F.3d 774, 783 (9th Cir. 2012) (noting that Bonneville's decision to sell power to Alcoa was consistent with sound business principles where the "total net benefit" to Bonneville was $10,000).

Continually Monitoring Gross Benefits and Neutrality Charges

PNGC encourages Bonneville to develop a metric, or set of metrics, that measure the net benefits of EIM participation rather than rely solely on the EIM quarterly gross benefits reported and Bonneville's share of those gross benefits.[367] PNGC notes that there are a number of costs, including neutrality costs, not included in the gross benefits reports. PNGC asks Bonneville to be mindful of its total costs of EIM participation and to monitor net benefit and costs to Bonneville and its customers on a continuous basis.[368]

Bonneville agrees that its participation in the EIM should be conducted in a way that seeks to achieve positive benefits, consistent with all statutory, contractual, and operational limitations. As Bonneville's business case demonstrates, Bonneville anticipates that joining the EIM will produce significant qualitative and quantitative benefits. These findings support moving forward with EIM participation.

PNGC asks Bonneville to develop a metric that would continually test whether the EIM remains beneficial to Bonneville and its customers. PNGC suggests one method of measurement: producing an ongoing "net" benefit calculation based on costs to customers.

PNGC's comment is largely outside of the scope of this process. The reasonableness of Bonneville's business decision to join the EIM is tested at the time the decision is made. PNGC's suggestion that Bonneville continually test its decision with frequent net benefit calculations performed after Bonneville joins the EIM would be a laborious process, taking up significant time and resources, and is not required by law. Further complicating this calculation is PNGC's suggestion that Bonneville perform this calculation from the perspective of Bonneville's customers. Bonneville does not view this effort as necessary when the business case Bonneville has already performed shows net benefits to Bonneville. If the EIM were to fundamentally change, as PNGC posits, with the result that Bonneville's customers were not receiving lower rates, greater reliability, or more efficient service, then it is likely that Bonneville would be aware of these shortcomings, and it would take appropriate actions to correct the situation.

In addition, PNGC's proposal ignores the significant qualitative benefits of joining the EIM. Tying Bonneville's EIM participation to a quarterly net benefit finding removes the operational and system efficiency benefits of the EIM. While not as quantifiable as the net benefits developed from more efficient generation dispatches, these benefits, as discussed earlier, are significant and would be absent from an ongoing net benefit calculation.

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[367] PNGC Comments at 1.
[368] *Id.*

BPA-2020-00784-F 0008

As to PNGC's concerns with neutrality charges, Bonneville appreciates that this factor of the EIM is an unknown. Neutrality charges are designed to ensure that the CAISO pays out no more or less than it takes in. In theory, then, neutrality charges should, on the whole, result in no net increase in cost or benefit to an EIM Entity. In practice, Bonneville recognizes that neutrality charges can have an impact on the costs and benefits of the EIM under certain system conditions. The factors leading to higher credits or debits in neutrality charges are very difficult to determine. Attempting to incorporate neutrality charges in Bonneville's business case would be extremely difficult to do and would likely be based on broad, speculative assumptions about market participation in and through Bonneville's balancing authority area. Given the amount of uncertainty in estimating neutrality charges, Bonneville has chosen not to attempt to include this factor in its business case analysis. However, Bonneville intends to stay actively engaged in the CAISO's stakeholder processes evaluating neutrality charges, and will ensure that these charges are designed to accurately and fairly distribute costs and benefits among EIM Entities.

Additional Qualitative Benefits and Factors to Consider in Deciding Whether Joining Is a Sound Business Decision

PPC supports Bonneville's "continued scoping efforts" for joining the EIM, but requests additional clarity on the specific findings in the business case portion of the Proposal.[369] PPC requests Bonneville clarify what, if any, considerations in addition to Bonneville's cost benefit analysis Bonneville is relying on to make its decision that joining the EIM is a "sound business decision."[370] PPC also notes there may be other qualitative benefits of the EIM not yet captured in the cost benefit analysis. PPC looks forward to working with Bonneville to help identify and discover these other benefits as Bonneville and stakeholders gain additional understanding of the EIM.[371]

The Proposal described Bonneville's business case for joining the EIM. This business case explored both the quantitative benefits (the cost and benefits analysis) and the qualitative benefits of joining the EIM (primarily transmission system benefits). Both the qualitative and quantitative aspects of the business case form an important part of the basis for Bonneville's business decision to proceed with EIM participation. As PPC acknowledges, there may be other qualitative benefits that Bonneville has not expressly identified in its business case. Bonneville agrees that these additional benefits will likely be found or better understood as Bonneville progresses through its implementation stage. However, Bonneville views the discovery of other qualitative or quantitative benefits of EIM

[369] PPC Comments at 5.
[370] *Id.* at 5-6.
[371] *Id.* at 6.

BPA-2020-00784-F 0008

participation as additive to the analysis Bonneville has already conducted. Thus, Bonneville does not believe that its business case analysis would need to be revisited simply because additional benefits of the EIM have been uncovered.

PPC recognizes that quantitative and qualitative benefits are important considerations in determining whether joining the EIM is a "sound business decision."[372] However, PPC urges Bonneville to consider other factors in making this business decision. Specifically, PPC suggests that Bonneville adopt PPC's proposed principle that joining the EIM is "consistent with a sound business rationale and advances the objectives of BPA's Strategic Plan, including providing competitive products and services, by capturing the full value of its power and transmission system."[373]

Bonneville has addressed PPC's request for additional principles in section 3.1. More broadly, though, Bonneville generally agrees with PPC's assessment that the strategic benefits of the EIM are also an important factor in determining the soundness of Bonneville's business decision. As explained more thoroughly in section 3.2.2.1, those strategic benefits include having a voice at the table to influence future EIM development and improvement. Bonneville finds that, in addition to the qualitative and quantitative benefits of joining the EIM, Bonneville's business interests would be furthered by gaining a greater voice in EIM formation and evolution. That voice can best be heard if Bonneville proactively participates in the EIM as an EIM Entity, rather than Bonneville's current state of being passively involved as a neighboring balancing authority area or customer of other EIM Entities.

EIM and Undercompensating for Federal Generation

WPUDA expresses concerns that the EIM market design may result in Bonneville resources being "undercompensated for the value they provide."[374] WPUDA requests Bonneville to consider whether the "inherent design" of the EIM undervalues Bonneville's resources if they are bid into the market and, if so, whether participation meets "the standard of sound business principles."[375] Mr. Pace makes a similar comment, noting there is "little value" in bidding in the EIM as presently constituted.[376]

The business case Bonneville has developed takes the EIM as it exists today, which primarily centers on real-time energy dispatches. Even with this more limited focus,

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[372] *Id.* at 5-6.
[373] *Id.*
[374] WPUDA Comments at 3.
[375] *Id.* at 4.
[376] PACE Comments at 1.

BPA-2020-00784-F 0008

though, Bonneville's business case shows that the EIM in its current form would provide significant benefits to Bonneville. Further, Bonneville does not agree that the EIM could undervalue Bonneville's bid in resources since Bonneville would be setting the bid ranges for dispatch. If the EIM is not dispatching Bonneville's resources, it would be because other resources, cheaper than Bonneville's, were available. That is not to say Bonneville is not interested in ensuring that there are marketing opportunities that properly value the flexibility and capacity of the federal system. Bonneville is working in multiple forums to ensure that the value of the federal system is properly and adequately compensated. Future market design enhancements have the prospect of expanding the market into time-frames and areas in which Bonneville could see additional value for the flexibility and capacity of the federal system. Bonneville intends to remain actively engaged in these processes to promote proper compensation for capacity and flexibility.

Decision

Bonneville's proposal to join the EIM is a sound business decision. Bonneville's business case shows that joining the EIM should produce both net quantitative benefits and qualitative benefits. The quantitative benefits include positive additional net annual revenue of $29-34 million. By joining the EIM Bonneville also expects numerous transmission benefits that would be difficult or costly to realize on their own. The EIM is able to provide compelling operational and commercial benefits that will enhance Bonneville's ability to more efficiently and effectively manage the FCRTS. Unless there are fundamental changes to underlying facts or market rules, Bonneville does not intend to redo its business case in Phase V.

Issue 3.4.2

Whether the business case should be revised to include additional information quantifying the transmission costs and benefits of joining the EIM.

Commenters' Positions

AWEC notes that the EIM is expected to produce a number of benefits for the transmission side, including improved reliability, reduced congestion, and reduced curtailments. These benefits, AWEC notes, can be difficult to quantify.[377]

PPC makes a similar comment, noting that many of the benefits associated with transmission service will directly accrue to Bonneville's transmission customers, which is one reason that the transmission benefits associated with participation are "difficult to

[377] AWEC Comments at 2.

BPA-2020-00784-F 0008

quantify."[378] PPC requests that Bonneville develop a methodology for estimating EIM benefits for both Power and Transmission.[379]

Renewable Northwest comments that it is encouraged by the potential that joining the EIM has of reducing the likelihood of curtailments or scheduling restrictions. Renewable Northwest states that the test of the EIM Total Flow constraint that Bonneville performed to compare the effectiveness of the EIM to provide flow reductions with that of traditional schedule curtailments indicates that this could be an important benefit to Bonneville and its transmission customers.[380]

Evaluation of Positions

Commenters generally agree that Bonneville's business case demonstrates that joining the EIM will likely result in qualitative benefits for the federal transmission system. NRU, AWEC, and PPC ask whether Bonneville can do more to quantify those benefits. PPC, in particular, suggests that Bonneville develop a methodology to assign costs and benefits between Power and Transmission.

As described above, in discussing the transmission benefits of EIM participation, Bonneville provided some illustrative examples of quantitative benefits that could be achieved on the transmission system. Bonneville, however, recognizes that these benefits were not as readily identifiable as the Power benefits. The qualitative benefits discussed in the Proposal show that the visibility and constraint management improvements, as well as other EIM tools, will improve Bonneville's ability to efficiently operate the transmission system, which is a benefit to all of Bonneville's customers. Trying to quantify these benefits in terms of greater usage of the existing transmission system or delayed or suspended transmission upgrades is very difficult due to all the other factors that influence a transmission build decision. Bonneville recognizes that these qualitative benefits will be an important aspect of the cost allocation decisions in the BP-22 rate proceeding. For purposes of this ROD, though, additional development of the transmission benefits is unnecessary to determine whether the business case is reasonable. As discussed above, identifying additional benefits of EIM participation (in this case on the transmission system) would be additive to the existing benefits analysis, which already demonstrates that joining the EIM would provide broad-reaching quantitative and qualitative benefits from an agency perspective.

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[378] PPC Comments at 7.
[379] *Id.*
[380] Renewable Northwest Comments at 2.

BPA-2020-00784-F 0008

Decision

Additional quantitative analysis of transmission benefits is unnecessary to support the business case. Bonneville recognizes that qualitative benefits must be considered for purposes of cost and benefit allocations.

3.5 EIM Policy Proposals

In its Proposal, Bonneville asked for comments on several policy matters. These policy matters are:

1. Federal Generation Participation Model
2. Transmission Usage – Interchange
3. System Operations Tools
4. Carbon Obligations and related considerations
5. Market Power (LMPM and DEB)
6. Load Aggregation
7. Resource Sufficiency – Balancing Authority Area Level

3.5.1 Federal Generation Participation Model

Bonneville's Proposal

Bonneville will initially participate in the EIM with federal hydroelectric dams aggregated into three resource zones comprised of the Upper Columbia dams (Grand Coulee and Chief Joseph), Lower Columbia dams (McNary, John Day, The Dalles, and Bonneville), and Lower Snake dams (Lower Granite, Little Goose, Lower Monumental, and Ice Harbor). These resource groups will participate in the EIM as separate aggregated Participating Resources (APR). The amount of generation produced by these resources not bid into the EIM will be treated as an aggregated non-participating resource (ANPR) for purposes of the EIM. All other federal resources in the Bonneville balancing authority area will initially be non-participating resources in the EIM.

Background and Context

Bonneville believes the EIM will provide Bonneville with new means to mitigate transmission congestion, as well as potential new opportunities to optimize the marketing of the FCRPS by monetizing its flexibility that would otherwise go unused. This optimization occurs within security constraints which seek to prevent the market's economic dispatch from causing congestion. The EIM develops price signals that reflect the extent to which those constraints are "binding" (*i.e.*, preventing an otherwise more

BPA-2020-00784-F 0008

economic dispatch). These price signals can help incentivize more efficient and reliable operation by reflecting operations and behaviors that implicate the security constraints.

These incentives, however, are limited to the extent market participants can effectively respond to the economic dispatch. As a general matter, the more accurately the EIM can model the resource responding to the congestion, the more certainty there is that the EIM will develop the most economic redispatch to relieve the congestion. The converse of this principle is also true. The less accurately the EIM can model the resource responding to congestion, the less confidence there is that the EIM will develop the most economic redispatch to relieve congestion. This distinction becomes important in the EIM when considering how Participating Resources are aggregated into a group.

The EIM permits a Participating Resource Scheduling Coordinator (PRSC) to aggregate its Participating Resources into one or more groups.[381] The benefit to grouping Participating Resources is that it distributes the market dispatch instruction over multiple resources. For instance, assume a PRSC bids a group of four resources into the EIM (Projects W, X, Y, Z), all of which have 25 MW of capability. If the EIM orders this group to *inc* by 40 MW, the EIM would distribute that order across all the projects based on a pre-defined distribution (referred to as a "generation distribution factor" or GDF). Assuming this group's GDF was .25, each Project in the group would be responsible for providing 25% of the 40 MW dispatch instruction, or 10 MW for each project (*e.g.,* W = 10 MW, X = 10 MW, Y = 10 MW, Z = 10 MW). Bonneville refers to this model as the aggregated participating resource or APR model.

The EIM also includes additional functionality that allows the PRSC to choose which resources within the group respond to a market dispatch.[382] This functionality comes through overlapping participating and non-participating resources in a group. Bonneville refers to this model as the overlapping aggregated participating and aggregated non-participating resource model or APR/ANPR model. Returning to our example, a PRSC using the APR/ANPR model could choose the distribution of the market instruction among the four projects (*e.g.*, W = 20 MW, X = 10 MW, Y = 10 MW, Z = 0 MW).

Both operating models—the APR model and APR/ANPR model—allow Bonneville to control the hydraulic impact of EIM activity on the closely linked river operations in a similar fashion to how they are managed today. That flexibility, however, comes at the cost

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[381] *See* EIM Business Practice Manual, CAISO, § 11.3.1, *available at* https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy Imbalance Market.
[382] *Id.*

BPA-2020-00784-F 0008

of not fully realizing the congestion relief and congestion revenue benefits that project level participation model would provide.

If Bonneville joins the EIM, Bonneville must decide how many APR groupings Bonneville intends to use to bid federal capability into the EIM. In addition, Bonneville must also determine whether it will use the APR/ANPR functionality to choose which generators within the aggregation will respond to market dispatches.

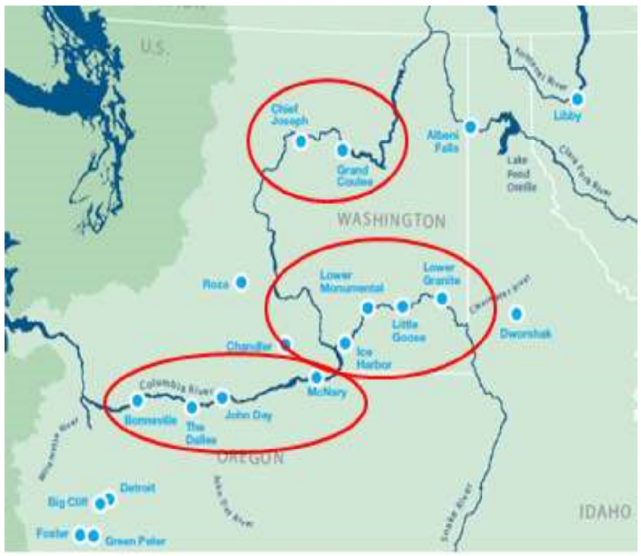
Aggregation of Federal Generation Proposal

Bonneville proposed aggregating the "Big-10" federal projects into three participating resource groups.

Upper Columbia:
- Grand Coulee (GCL)
- Chief Joseph (CHJ)

Lower Snake:
- Lower Granite (LWG)
- Little Goose (LGS)
- Lower Monumental (LMN)
- Ice Harbor (IHR)

Lower Columbia:
- McNary (MCN)
- John Day (JDA)
- The Dalles (TDA)
- Bonneville (BON)



Bonneville has proposed to only aggregate the Big-10 projects into APRs because these are the federal projects that currently have the technical controls and hydraulic capabilities best suited to respond to EIM dispatches. The other 21 federal dams do not have the same controls or flexibility as these projects.

Bonneville has proposed the three participating resource aggregation model based on several factors. First, Bonneville considered the electrical similarities of the Big-10 projects. Bonneville conducted an electrical similarity analysis to determine how a change in generation at each project affects various transmission flowgates. The analysis looked at Bonneville's internal/network flowgates and established a set of Generation Shift Factors

(GSFs) for each project, assuming all transmission lines were in service. Projects that had similar GSFs were considered to be electrically similar for that flowgate.[383]

Second, the three participating resource aggregation model also appropriately captures the unique hydraulic and operational aspects of the Big-10 projects. Storage projects operating in the upper part of the Columbia River system generally have different hydrologic and operating conditions and requirements than the projects located on the lower part of the Columbia River system, and the lower Snake River projects have their own unique requirements.

Bonneville considered other participation models, including less aggregation (making the Big-10 a single APR), and more (bidding in the available capability of each project from the Big-10). The following table shows the pros/cons of each model.

Participation Alternative	Pros	Cons
One Aggregate	• Most similar to the current way of optimizing the FCRPS– less implementation requirements and costs to join the EIM	• Least efficient congestion relief and optimization of FCRPS • Lack of additional revenue associated with different Locational Marginal Prices (LMP)
Three Aggregates (Proposed)	• More efficient congestion relief than One Aggregate alternative • Moderate additional revenue opportunities associated with different LMPs	• May not fully realize congestion relief and revenue benefits that Project Level alternative would provide • Will require additional implementation requirements
Project Level	• Most efficient congestion relief • Most additional revenue opportunities associated with different LMPs	• More complexity, which increases the risk that BPA may, through its bids, operate the FCRPS less efficiently. • Will require additional implementation requirements

Bonneville has proposed to use the three participating resource aggregation model because it provides an appropriate balance between capturing the congestion benefits of the EIM while maintaining Bonneville's flexibility to respond and adjust to operational

[383] In the analysis, if the difference between any two GSFs were less than 10%, the resources were considered to be electrically similar. Bonneville shared the results of its electrical similarity analysis with stakeholders at the October 11, 2018 public stakeholder meeting. *See* https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181011-October-11-2018-EIM-Stakeholder-Mtg.pdf (slides 33-36).

circumstances unique to each of the Big-10 projects. Bonneville views the three-aggregation proposal as a "starting point" for its initial participation in the EIM. Bonneville may modify its participation model, (*e.g.,* adding APRs, removing APRs) as Bonneville gains experience and confidence in the EIM. In addition, Bonneville's proposed aggregation must be reviewed by the CAISO before Bonneville joins the EIM.[384]

Overlapping Participating and Non-Participating Aggregation

Bonneville also proposed to use the APR/ANPR overlapping aggregation model. That is, each group of Participating Resources will have an amount of generation designated as participating in the EIM and another amount designated as non-participating. The benefit to Bonneville of this paradigm is that Bonneville can apply different "generation distribution factors"[385] to the participating and non-participating portions of the grouped resources. This functionality is preferable because it allows Bonneville to choose which generators respond to a market dispatch. Bifurcating the aggregations in this manner is consistent with how Bonneville operates federal resources today.

Issue 3.5.1.1

What should Bonneville's plan be for federal generation participation?

Commenters' Positions

The Slice Group "supports Bonneville's proposed Federal Generation Participation Plan and agrees it provides a logical balance of flexibility and efficiency that is a good starting point for gaining experience in market participation."[386]

PPC "generally agree[s] with BPA's policy proposals but seek[s] additional clarification on some of BPA's positions."[387] PPC believes that "BPA's initial plan to have the 'Big 10' hydro projects participate in the EIM through three aggregated resource groups seems reasonable, subject to more discussion on the consistency with the agency's system sales

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[384] *See* Market Operations Business Practice Manual v.60, CAISO, §3.1.2, *available at* https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market Operations.

[385] In this context, a generation distribution factor is the percentage of an individual resource's share of the total aggregate for both the participating and non-participating portions of the aggregation. For example, for the Upper Columbia aggregation, Bonneville may designate Grand Coulee as .66 and Chief Joseph as .34 for the participating portion of the aggregation, and Grand Coulee as .34 and Chief Joseph as .66 for the non-participating portion of the aggregation. The overlapping aggregation and non-aggregation paradigm will allow Bonneville to manage resource dispatch as it does today.

[386] Slice Group Comments at 5.

[387] PPC Comments at 7.

BPA-2020-00784-F 0008

approach as described above."[388] PPC notes "[t]he proposal discusses this as an initial approach and agency staff has indicated that the preferred approach may change over time," and requests that "[i]f the agency wanted to pursue a change to this approach, that change should be discussed at a customer stakeholder meeting so the impacts can be fully vetted."[389]

NWEC appreciates the detail in Bonneville's supporting documentation, stating,

> The materials accompanying the Letter to the Region provide many examples and not only describe Bonneville's approach but also provide helpful context and consideration of alternatives. For example, selecting and grouping participating resources is a complex matter given the interconnected nature of the federal hydrosystem. The explanation provided for the Federal Generation Participation Plan (Appendix A, p. 59) provides a very clear walkthrough of how the three resource zones for the Big 10 participating resources have been selected. This level of detail throughout the document will not only build confidence in Bonneville's approach but provide essential context when changes are made going forward.[390]

WPAG also generally supports Bonneville's policy proposal on the Federal Generation Participation model.[391]

Evaluation of Positions

The Slice Group, PPC, NWEC, and WPAG support Bonneville's initial plan to have federal generation participate in the EIM through three aggregated resource groups.[392] No stakeholder comments oppose this plan. The Slice Group "agrees it provides a logical balance of flexibility and efficiency that is a good starting point for gaining experience in market participation."[393] NWEC believes the level of detail in Bonneville's explanation will "build confidence in Bonneville's approach."[394] Bonneville appreciates this support. PPC "generally agree[s]" with Bonneville's initial plan, saying it "seems reasonable, subject to more discussion on the consistency with the agency's system sales approach."[395] Regarding system sales, Issue 3.2.3 discusses how bidding federal generation into the EIM is consistent with Bonneville's statutes.

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[388] *Id.*
[389] *Id.*
[390] NWEC Comments at 3.
[391] WPAG Comments at 7.
[392] Slice Group Comments at 5; PPC Comments at 7; NWEC Comments at 3; WPAG Comments at 7.
[393] Slice Group Comments at 5.
[394] NWEC Comments at 3.
[395] PPC Comments at 7.

BPA-2020-00784-F 0008

The Slice Group, NWEC, and PPC also acknowledge that Bonneville could change how federal generation participates in the EIM.[396] The Slice Group refers to Bonneville's initial plan as "a good starting point."[397] NWEC believes that Bonneville's explanation of its current plan will "provide essential context when changes are made going forward."[398] PPC requests that future changes "should be discussed at a customer stakeholder meeting so the impacts can be fully vetted."[399]

Bonneville agrees that it could change how federal generation participates in the EIM, including changing the aggregation of the federal projects. Bonneville values stakeholder input and intends to inform and discuss these changes with stakeholders, if and when they occur. At this point, though, Bonneville is not prepared to commit to a particular process for communicating these changes. Bonneville will determine the appropriate level of public process based on future circumstances and the nature of any proposed change.

NWEC compliments Bonneville's explanation of its federal generation participation plan, finding that it "provides a very clear walkthrough" of "a complex matter."[400] Bonneville appreciates these positive comments, and values continued stakeholder participation.

Decision

If Bonneville joins the EIM, it will initially participate with the Big-10 federal hydroelectric dams aggregated into three resource groups.

3.5.2 Transmission Usage – Interchange

Overview of EIM Transfers

As part of its decision to join the EIM, Bonneville must determine how it will make transmission available for EIM Transfers. EIM Transfers represent the net transfer of energy between EIM Entity balancing authority areas. The EIM uses transmission made available for EIM Transfers to develop the optimal dispatch of generation throughout the EIM footprint. Without transmission for EIM Transfers, the EIM can only optimize the load and generation within individual EIM Entities' balancing authority areas.

Energy delivered through EIM Transfers is not specifically tied to individual generators or loads, but is modeled as an *aggregate* delivery of power between EIM Entity balancing

[396] *Id.* at 7; Slice Group Comments at 5; NWEC Comments at 3.
[397] Slice Group Comments at 5.
[398] NWEC Comments at 3.
[399] PPC Comments at 7.
[400] NWEC Comments at 3.

BPA-2020-00784-F 0008

authority areas. Further, energy delivered to an EIM Entity's balancing authority area through an EIM Transfer may not ultimately serve load within that EIM Entity's balancing authority area. Instead, that energy may be used to facilitate further EIM Transfers to other EIM Entities. Transmission used to facilitate EIM Transfers is not reserved for any individual market participant's use. Rather, the EIM uses this transmission to develop the optimal wide-area dispatch. EIM Transfers only reflect the transfer of energy between EIM Entity balancing authority areas, not the transfer or transmission of energy within an EIM Entity's balancing authority area. EIM Transfers are limited to how much transmission capacity has been made available to the EIM to facilitate the transfer of energy among EIM Entities.

There are two existing methods of making transmission available for EIM Transfers:

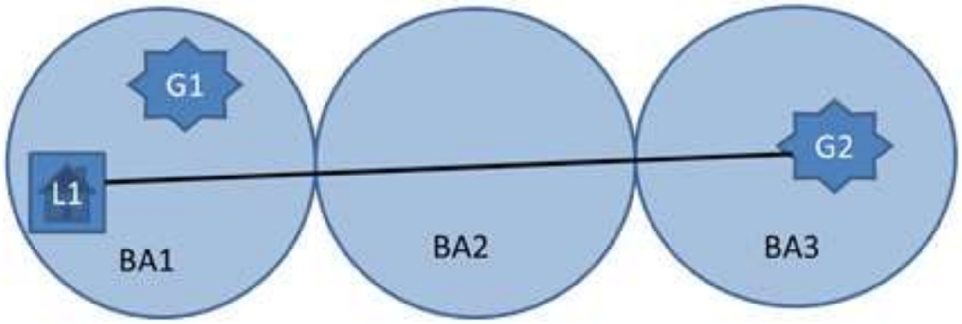
> *a. Direct Provision Methodology*: The EIM Entity makes unscheduled transmission capacity between itself and other EIM Entities available for EIM Transfers. Such transmission capacity is non-firm and would be curtailed before all other transmission schedules at the North American Electric Reliability Corporation (NERC) curtailment priority level of 0-NX. To date, no EIM Entity is directly compensated for the transmission made available to the EIM in this way, although it may collect congestion revenue under certain circumstances.
>
> *b. Interchange Rights Holder Methodology*: A transmission customer with long-term firm Point-to-Point transmission service between two EIM Entities (*i.e.*, an Interchange Rights Holder) may "donate" all or a portion of that long-term firm PTP transmission service to the EIM to facilitate EIM Transfers at the continuing discretion of the transmission rights holder. The transmission customer continues to pay the EIM Entity the applicable rate for long-term firm PTP transmission service, and the customer may collect congestion revenue under certain circumstances.

Bonneville's Proposal

Bonneville is proposing to adopt the Interchange Rights Holder Methodology. Given the size and the position of the FCRTS, Bonneville expects to be a significant "net wheeler" in the EIM. In other words, Bonneville expects that a significant amount of EIM Transfers will originate in one EIM Entity's balancing authority area, be "wheeled" or transferred through the FCRTS, and ultimately serve load in another EIM Entity's balancing authority area. Under these circumstances, Bonneville believes the Interchange Rights Holder Methodology better balances the need to provide transmission to the EIM with collecting

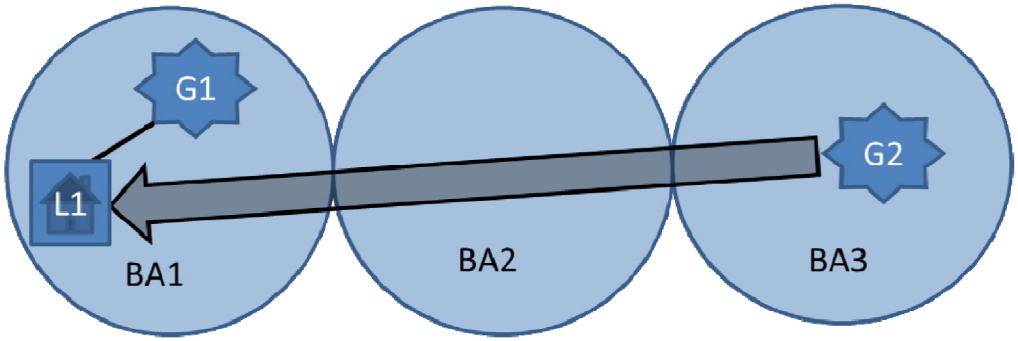
BPA-2020-00784-F 0008

enough revenue to adequately and fairly recover the costs of the FCRTS. Under the Direct Provision Methodology, an EIM Entity does not receive compensation for the transmission it makes available to the market. On the other hand, the Interchange Rights Holder Methodology ensures that Bonneville is compensated for the transmission service provided to the EIM. This methodology gives an interchange rights holder the ability to choose how to best use their transmission service. See the figures below for a demonstration of net-wheeling.



Example 1: Absent the EIM – Currently, Transmission Is Purchased Across Each Balancing Authority Area

Load L1 purchases and schedules transmission across BA1, BA2, and BA3 in order to access the cheaper generation G2. G1, a high cost generator, is dispatched to supply balancing in BA1.



Example 2: With the Direct Provision Methodology – Unrecovered Costs

Load L1 purchases transmission in BA1, and schedules from generator G1, a high cost generator thus satisfying its resource sufficiency requirement. However, in operations, the EIM dispatches the cheaper generation G2 to serve L1, using uncompensated transmission across BA2.

The Interchange Rights Holder Methodology is consistent with FERC precedent

The Interchange Rights Holder methodology is established and tested in the EIM. In fact, the first EIM Transfers were made available in this manner on the Northwest AC Intertie for transfers between PACW and the CAISO. This method has been developed and established when there are multiple transmission owners and operators of transmission paths. FERC has accepted Tariff provisions from multiple EIM Entities for the provision of EIM Transfer transmission via the Interchange Rights Holder methodology.[401] Further, since it has been in wide use throughout the Pacific Northwest over the last few years, it has been proven to provide sufficient transmission for the proper functioning of the EIM as it is designed today.[402] As the EIM and other markets evolve in the West, Bonneville will evaluate if any changes need to be made to this policy.

Issue 3.5.2.1

Whether Bonneville should have discretion in deciding how to make transmission available for EIM Transfers.

Commenters' Positions

NV Energy recommends that Bonneville "commit to make ATC available in a manner commensurate with the other EIM Entity transmission providers," and that Bonneville revise section 14(b) of the EIM Implementation Agreement to limit its discretion in determining how to make transmission available for EIM Transfers.[403]

Evaluation of Positions

The EIM does not require that all transmission providers make transmission service available in a certain manner, and it is not necessary for Bonneville to agree to such a requirement to join the EIM.[404] NV Energy also does not explain what benefits Bonneville would receive by limiting its discretion to make transmission service available for EIM Transfers. Bonneville does not believe it is prudent to adopt NV Energy's proposal to revise section 14(b) of the draft EIM Implementation Agreement without clearly identified benefits to Bonneville and its customers.

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[401] *See, e.g., PacifiCorp*, 147 FERC ¶ 61,227, at P 113 (2014); *PacifiCorp*, 149 FERC ¶ 61,057, at P 32 (2014); *Puget Sound Energy*, 155 FERC ¶ 61,111, at PP 11, 73, 76 (2016).
[402] *Id.*
[403] NV Energy Comments at 4.
[404] As noted above, FERC has approved two different methodologies for making transmission available for EIM Transfers, and there is no requirement to use a particular methodology.

BPA-2020-00784-F 0008

Decision

Bonneville will retain section 14(b) of the EIM Implementation Agreement, and will determine how to make transmission available for EIM Transfers.

Issue 3.5.2.2

How should Bonneville make transmission available for EIM Transfers?

Commenters' Positions

NV Energy requests that Bonneville make all unused transmission capacity available for EIM Transfers, which it claims is consistent with how all other EIM Entities make transmission available for EIM Transfers.[405] NV Energy argues that its method makes more transmission available to the EIM, and that it would be "problematic" for Bonneville to use a different approach.[406] NV Energy also states that Bonneville's concerns regarding cost recovery are best addressed in a CAISO stakeholder process.

Seattle states that Bonneville should further examine the Interchange Rights Methodology and potentially use a hybrid of both the Interchange Rights Methodology and the Direct Provision Methodology.[407] This could allow market participants to obtain greater benefits from the EIM.[408]

PPC supports Bonneville's proposal to use the Interchange Rights Methodology. PPC states that the Interchange Methodology is "straightforward" and "ensure[s] that BPA is fully compensated for use of its transmission."[409]

Tacoma requests that Bonneville allow customers with non-firm transmission service to voluntarily donate such service to the EIM.[410] Tacoma argues that it should be possible to donate non-firm transmission service because Bonneville recently proposed changing its business practice to permit dynamic scheduling on non-firm transmission service.[411]

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[405] NV Energy Comments at 1.
[406] *Id.* at 3.
[407] Seattle Comments at 3.
[408] *Id.*
[409] PPC Comments at 7.
[410] Tacoma Comments at 1-2.
[411] *Id.*

BPA-2020-00784-F 0008

Evaluation of Positions

NV Energy argues that Bonneville should use the Direct Provision Methodology because "[f]ree use of transmission in the EIM is on a 'reciprocal' basis in accordance with FERC's Orders approving the EIM design."[412] To be clear, however, Bonneville is not proposing to directly charge EIM-participating generation or load for transmission service across the FCRTS. Under the Interchange Rights Methodology, Bonneville's transmission customers, not EIM-participating generation or load, would continue to pay Bonneville for transmission service that they have already reserved. Bonneville's customers could then voluntarily donate such transmission service to the EIM. Therefore, while the transmission that Bonneville provides under the Interchange Rights Methodology is free for other EIM Entities and participants to use, Bonneville is nonetheless compensated for that transmission by its existing customers. Accordingly, FERC has found that the Interchange Rights Methodology and the Direct Provision Methodology are consistent with each other.[413] Bonneville continues to believe that the Interchange Rights Methodology strikes the right balance between making transmission available to the EIM and ensuring that Bonneville is compensated for the use of its transmission system.

Bonneville remains concerned that the Direct Provision Methodology would not allow it to adequately and fairly recover the costs of the FCRTS. Under the Direct Provision Methodology, Bonneville would make unused transmission available to the EIM, but it would receive no compensation from either its existing customers or the EIM.[414] Under the Interchange Rights Methodology, Bonneville is making available the amount of transmission service that its customers have purchased and voluntarily donated to the EIM. Bonneville must be compensated for the transmission service it provides to recover its costs, and is not opposed to the Direct Provision Methodology if it can receive compensation.

NV Energy states that the CAISO has concluded that the benefits of not paying for transmission on intervening transmission systems (wheeling) outweigh the costs.[415] Again, however, Bonneville is not proposing to charge EIM-participating generation or loads for transmission service. Rather, as explained above, customers that have reserved (and pay for) transmission service on the FCRTS would be able to donate that transmission

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[412] NV Energy Comments at 3.
[413] *Nevada Power Co.*, 151 FERC ¶ 61,131, at P 117 (2015) ("We find that NV Energy's proposal not to assess incremental transmission charges for transfers related to the EIM is consistent with PacifiCorp's EIM OATT provisions [Interchange Rights Methodology], which the Commission previously accepted."; *see also PacifiCorp*, 147 FERC ¶ 61,227, at P 113 (2014) (adopting the Interchange Rights Methodology).
[414] There is no explicit requirement that an EIM Entity must make *all* unused transmission available to the EIM under the Direct Provision Methodology
[415] NV Energy Comments at 4.

BPA-2020-00784-F 0008

service to the EIM, and the EIM could use that transmission service at no charge. Further, the CAISO's finding did not attempt to evaluate the potential use of and impact on the FCRTS under the Direct Provision Methodology, *i.e.*, the CAISO's conclusion was focused on what was best for the EIM at the time.

In response to Seattle's and NV Energy's comments,[416] Bonneville acknowledges that the Interchange Rights Methodology limits the transmission available to the amount that customers are willing to pay for and donate to the EIM. It is axiomatic that making a product or service available at no charge to anyone (transmission service, in this case) would increase the use of that good or service. However, as Bonneville indicated in its proposal, Pacific Northwest EIM Entities largely rely on the Interchange Rights Methodology today. NV Energy states that EIM Entities like Portland General Electric and Puget Sound Energy make all unused transmission between their respective balancing authority areas and other EIM Entities' balancing authority areas available for EIM Transfers.[417] This ignores the fact that these Pacific Northwest EIM Entity balancing authority areas have limited direct connections with other EIM Entity balancing authority areas and, therefore, cannot access other EIM Entity balancing authority areas without first flowing across the FCRTS.[418] Currently Bonneville uses the Interchange Rights Methodology to enable these transactions. In other words, it only permits these transactions to flow across the FCRTS if a transmission customer reserves (and pays for) transmission service, and the customer decides to donate that transmission service to the EIM. Bonneville does not allow these transactions to flow across the FCRTS for free.

Thus, though these EIM Entities may use some form of the Direct Provision Methodology on their own transmission systems, they frequently rely on the use of the FCRTS for some component of their EIM Transfers. Further, there are multiple paths that are owned by multiple transmission service providers but are operated by Bonneville.[419] EIM Transfers on these paths are also conducted via the Interchange Rights Methodology due to the scheduling arrangements needed to accommodate the jointly-owned nature of the assets.

This paradigm has not prevented Pacific Northwest EIM Entities from receiving substantial benefits from the EIM.[420] By continuing this approach, Bonneville does not expect this to change. Bonneville will study Tacoma's proposal to allow non-firm transmission

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[416] NV Energy Comments at 3; Seattle Comments at 3.
[417] NV Energy Comments at 2-3.
[418] *See* Western EIM Map, *available at* https://www.westerneim.com/Pages/About/default.aspx. Puget Sound Energy's balancing authority area is not adjacent to any other current EIM transmission provider. Portland General Electric's balancing authority area is only adjacent to PacifiCorp-West.
[419] These include the Northern Intertie (Path 3) and the Northwest AC Intertie ("NWACI" or Path 66).
[420] *See* Western EIM Benefits, *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.

BPA-2020-00784-F 0008

customers to donate transmission service to the EIM.[421] If Bonneville can adopt such an approach, it could make more transmission available to the EIM and further alleviate NV Energy's and Seattle's concerns.

NV Energy argues that Bonneville should adopt the Direct Provision Methodology and then allow the CAISO to determine whether Bonneville should be compensated for the transmission that it provides the EIM through a CAISO stakeholder process.[422] Under section 7 of the Northwest Power Act, Bonneville must ensure that it recovers its costs.[423] It is not appropriate to allow a CAISO stakeholder process to determine whether Bonneville can adequately and fairly recover the costs of the FCRTS. Furthermore, the CAISO declined to conduct such a process in the past.[424] As PPC states, the Interchange Rights Methodology is a straightforward way to ensure that Bonneville is fully compensated for the use of its transmission without relying on an uncertain CAISO stakeholder process.[425] Nonetheless, Bonneville strongly agrees with NV Energy that compensation for transmission under the Direct Provision Methodology should be discussed with the CAISO and EIM Entities as soon as practicable, and is eager to participate in these discussions. If Bonneville can be compensated for its transmission, then Bonneville will examine whether to adopt the Direct Provision Methodology.

NV Energy claims that it would be "problematic" if it uses the Direct Provision Methodology for EIM Transfers on Path 76 (where Bonneville and NV Energy are interconnected), but Bonneville uses the Interchange Rights Methodology.[426] NV Energy does not explain why this would be problematic and no other EIM Entity has expressed similar concerns to Bonneville. In addition, as discussed above, Bonneville currently facilitates EIM Transfers over Paths 3 and 66 in which EIM Entities utilize the Interchange Rights Methodology, and FERC has found that the Direct Provision and the Interchange Rights Methodologies are consistent with each other.[427]

Finally, Seattle requests that Bonneville study using a hybrid of the Interchange Rights Methodology and the Direct Provision Methodology.[428] As stated above, Bonneville will

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[421] Tacoma Comments at 1-2.
[422] NV Energy Comments at 1.
[423] 16 U.S.C. § 839e
[424] NV Energy Comments at 3-4.
[425] PPC Comments at 7.
[426] NV Energy Comments at 3.
[427] *Nevada Power Co.*, 151 FERC ¶ 61,131, at P 117 (2015) ("We find that NV Energy's proposal not to assess incremental transmission charges for transfers related to the EIM is consistent with PacifiCorp's EIM OATT provisions [Interchange Rights Methodology], which the Commission previously accepted." *See also PacifiCorp*, 147 FERC ¶ 61,227, at P 113 (2014) (adopting the Interchange Rights Methodology).
[428] Seattle Comments at 3.

BPA-2020-00784-F 0008

consider adopting the Direct Provision Methodology if the CAISO develops a method to compensate EIM transmission providers. PPC states that Bonneville should only change its methodology "through a stakeholder process which includes an extensive review of the rate design for such use."[429] Bonneville agrees with PPC and will conduct a stakeholder process before changing its methodology.

Decision

Bonneville will adopt the Interchange Rights Methodology for making transmission available to EIM Transfers.

3.5.3 System Operations Tools

Background

This section focuses on the operational tools currently used by Bonneville to meet its reliability and environmental responsibilities, and whether Bonneville can continue to use these tools if it joins the EIM. In short, Bonneville believes that it can continue using these tools if it joins the EIM.

Before addressing specific tools below, it is important to note two general principles. First, in regard to applicable NERC reliability standards, Bonneville will continue to be solely responsible for complying with those standards in its balancing authority area and for the transmission system it owns or operates even if it joins the EIM. The CAISO assumes no responsibility regarding reliability standards applicable to EIM Entities.

Second, Bonneville will also remain responsible for meeting its environmental responsibilities if it joins the EIM. While the CAISO, as the EIM market operator, will respect Bonneville's environmental responsibilities, the CAISO will not be responsible for complying with those obligations.

Finally, it is worth noting that Bonneville employs many operational systems, tools, and processes to reliably operate the federal power and transmission systems in order to meet its Tariff, compliance, and environmental requirements. Bonneville believes these operational systems, tools, and processes are compatible with the EIM and will continue their use if it joins the EIM.

[429] PPC Comments at 7.

BPA-2020-00784-F 0008

Bonneville has received specific inquiries about two of its operational tools—Operational Controls for Balancing Reserves (OCBR) and Oversupply Management Protocol (OMP)—regarding how they would be impacted if Bonneville were to become an EIM Entity. The following two subsections specifically address those tools. Based on Bonneville's analysis and discussions with the CAISO to date, Bonneville can become an EIM Entity and maintain both of these tools.

Operational Controls for Balancing Reserves (OCBR)

OCBR is a system reliability tool that Bonneville uses to balance load and generation in its balancing authority area.[430] Generally, actual generation and load should match scheduled generation and load for the hour. Bonneville uses OCBR when within-hour variability of generation and load consumes balancing reserve capacity to a certain level. Under OCBR, Bonneville will take steps to reduce variability, such as curtailing generation schedules to actual generation levels or limiting generation to schedule, in order to maintain Bonneville's system reliability.

While the EIM will optimally dispatch imbalance energy every 5 minutes to Bonneville's balancing authority area, Bonneville believes that it is important to maintain OCBR. Bonneville is still required to hold and deploy regulation to balance generation and loads in its balancing authority area within the CAISO's 5-minute EIM dispatches, for which OCBR will be necessary to manage regulation over-deployment. OCBR is also necessary to maintain in case Bonneville is unable to participate in the market (*e.g.*, withdraws or fails resource sufficiency for a given interval).

Oversupply Management Protocol (OMP)

OMP is an operational tool used to address certain environmental conditions in the Columbia River Basin and maintain load-generation balance in Bonneville's balancing authority area during those conditions. During times of high river flows, typically in the spring when loads in Bonneville's balancing authority area are low, water must be passed through the dams in one of two ways: spilled over the dams, or run through the turbines to generate electricity. When water is spilled over the dams, it creates bubbles of air in the water that, at certain levels, can be harmful to salmon and other aquatic species. This is referred to as total dissolved gas (TDG) and is regulated by the states of Oregon and Washington under the Clean Water Act.

[430] Bonneville uses certain hydro projects in the FCRPS to respond to within-hour deviations in generation and load by constantly increasing and decreasing generation output. This balancing is necessary to keep the electric system stable.

BPA-2020-00784-F 0008

When the Columbia River reaches TDG limits, Bonneville must limit spill by passing water through the generating turbines, thus creating electricity. Bonneville offers this electricity as low as zero cost; however, in the spring, there are occasions when there is not sufficient load to use the electricity, even at zero cost. As a result, Bonneville adopted Attachment P to its Transmission Tariff, creating a least-cost cost curve for displacing generation in the balancing authority area and reimbursing displaced generators for certain costs related to the displacement, so that Bonneville can pass water through its generating turbines and maintain generation-load balance. Attachment P has been approved by FERC under section 211A of the Federal Power Act.[431]

Bonneville Proposal

Bonneville proposed to maintain OMP as it is currently set forth in Attachment P. If Bonneville joins the EIM, it still needs a mechanism to reduce generation located in its balancing authority area to minimum generation levels in order to comply with its environmental responsibilities. Bonneville does not believe that the EIM provides a market solution that achieves that objective as effectively as OMP today. That said, Bonneville will consider other methods of managing over-generation in its balancing authority area if more effective ways of achieving the goals of OMP are discovered. OMP is also necessary to maintain in case Bonneville is unable to participate in the market (*e.g.*, withdraws or fails resource sufficiency for a given interval).

Joining the EIM would not change Bonneville's system reliability and environmental responsibilities that necessitate the system operations tools discussed above. As such, Bonneville proposed to maintain these tools to manage the federal power and transmission systems if it becomes an EIM Entity.

Issue 3.5.3.1

Whether Bonneville should maintain its current system operations tools if it becomes an EIM Entity.

Commenters' Positions

Renewable Northwest "encourages Bonneville to adopt language in its [ROD] that allows it sufficient flexibility regarding future use of its system operation tools," and to "explore how

[431] *Iberdrola Renewables, Inc. v. Bonneville Power Admin.*, 149 FERC ¶ 61,044 (2014).

BPA-2020-00784-F 0008

participating in the EIM could help minimize its reliance on OMP and OCBR."[432] In addition, WPUDA comments that Bonneville should "maintain a ready fall back to EIM participation" in case Bonneville's statutory responsibility to preference customers prevents participation in the EIM, and "requests a commitment from BPA that it will maintain, update and otherwise support all the tools necessary to fully separate from the CAISO and to independently operate its generation and transmission systems."[433]

Evaluation of Positions

Renewable Northwest requests that Bonneville adopt language in the ROD to give Bonneville flexibility to address future use of its system operation tools. Bonneville is always open to reevaluating operational tools as new circumstances arise, and specific language is not necessary to preserve that outcome. As stated in Bonneville's proposal, Bonneville does not believe that the EIM provides Bonneville solutions that would supersede the need to have OCBR and OMP as system reliability tools. Further, Bonneville does not believe that EIM participation requires changes to its existing tools. As such, Bonneville intends to maintain these tools if it becomes an EIM Entity. However, while Bonneville is not committing to any specific process, Bonneville is open to reevaluating the use of OMP and OCBR if EIM participation materially changes the need to use those tools.

WPUDA requests that Bonneville maintain the tools necessary to independently operate its systems in case it cannot participate in the EIM due to its statutory responsibility to preference customers. Bonneville agrees with the principle that, in addition to Bonneville having the right to withdraw its voluntary participation in the EIM, Bonneville must also maintain the practical ability to withdraw. But WPUDA's comments appear to suggest that Bonneville may rely on the EIM to meet its system obligations. That is not the case. Even if Bonneville joins the EIM, Bonneville still retains the independent obligation to reliably operate the federal power and transmission systems. Bonneville must retain all system operating tools that will allow it to do so.

Decision

Bonneville will maintain its current suite of operational tools used to manage the federal power and transmission systems if it becomes an EIM Entity.

[432] Renewable Northwest Comments at 3-4.
[433] WPUDA Comments at 2.

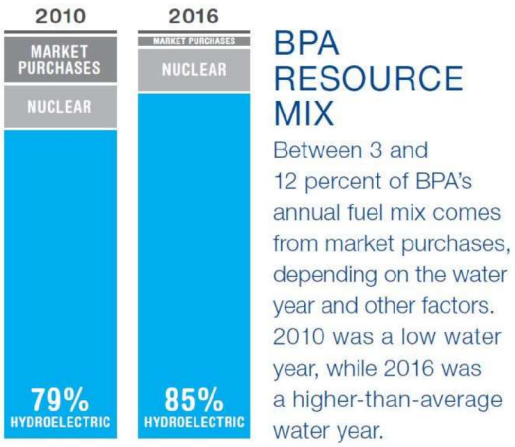
BPA-2020-00784-F 0008

3.5.4 Carbon Obligations and Related Matters

Background on Carbon in the EIM

In accordance with California's cap-and-trade program administered by the California Air Resources Board (CARB), any entity that exports electricity into California (from another state) must purchase carbon allowances to cover carbon emissions associated with the electricity imported into California. If other states adopt cap-and-trade or other carbon pricing programs, electricity that is imported into those states could be similarly regulated.

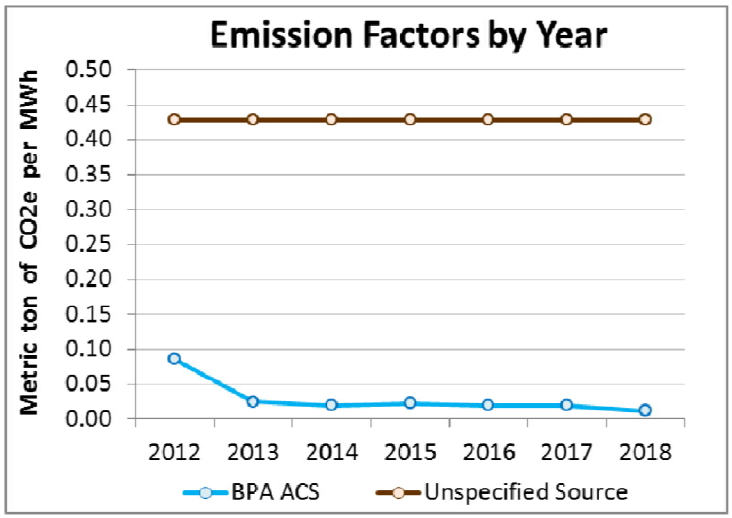
While the hydro system and Columbia Generating Station produce carbon-free electricity, there is a small amount of carbon associated with the FCRPS. Bonneville uses federal power produced by FCRPS and other resources (non-federal) it acquires to meet its contractual supply obligations. In meeting those obligations Bonneville regularly acquires power from the market to balance its resources and loads. Market purchases typically account for between 3 to 12 percent of Bonneville's total annual power supply. States with greenhouse gas (GHG) reporting programs such as California typically attribute a default emissions factor to market purchases. Thus, because of the emissions attributed to the market purchases, the FCRPS as a whole has a small amount of carbon emissions associated with it.



Since the implementation of the California-cap-and-trade program in 2013, Bonneville has been recognized by the CARB as an Asset Controlling Supplier (ACS). An ACS is a specific type of electric power entity approved and registered by CARB. CARB assigns a system emission factor for the wholesale electricity procured from the ACS's system and imported into California. Bonneville and two other entities (Tacoma and Powerex) have been approved by CARB as ACSs. Bonneville voluntarily reports its fuel mix data to CARB and, based on that reporting, CARB assigns Bonneville an ACS emissions factor. Bonneville's

BPA-2020-00784-F 0008

ACS emission factor has been very low over the last few years, averaging around 0.02 metric tons of CO_2 equivalent per MWh. This constitutes a need to purchase roughly one allowance for every 50 MWh sold into California, and the cost of compliance is roughly $0.30 per MWh at prevailing carbon allowance prices.



Units:	Metric ton CO2e per MWh	MWh	$ per metric ton CO2e	$ per MWh
Source	**Emission Factor**	**Imported Power**	**GHG Allowance Price**	**GHG Cost**
Unspecified Source	0.43	1	$16	$6.8
BPA ACS	0.02	1	$16	$0.3
Difference	0.41			$6.5

This low ACS emission factor adds value to FCRPS sales into the California market. However, the federal government has determined that California carbon allowances constitute a state tax. Under the U.S. Constitution a state cannot tax the federal government, in particular a federal agency like Bonneville, unless Congress specifically authorizes the agency to pay the tax. As a consequence, Bonneville currently cannot purchase these allowances. In order to sell into California without purchasing carbon allowances, Bonneville has entered into third-party arrangements to sell to entities that, in turn, take Bonneville's power into the California market and incur the resulting carbon

compliance obligation. These third-party arrangements are inefficient and have an incremental cost. In the near future, Bonneville's inability to purchase carbon allowances could impact Bonneville's marketing in other western states if other states adopt cap-and-trade programs similar to California's.

As it pertains specifically to the EIM, CARB considers the Participating Resource Scheduling Coordinator to be the entity with the compliance obligation under the cap-and-trade program, meaning the Participating Resource Scheduling Coordinator is responsible for acquiring the allowances to cover any carbon associated with the EIM import. Entities participating in the EIM must indicate a GHG adder cost in their bid that reflects the cost of purchasing any allowances associated with the import. However, there is an option that Participating Resource Scheduling Coordinator can choose to avoid deliveries to California and thus avoid the GHG adder cost.

Bonneville is proposing to use three aggregations of the big-10[434] hydro projects for bidding resources into the EIM, but the ACS emissions factor would still be attributed to Bonneville's bids. This is because of the system sales concept, discussed in section 3.2.3, and because Bonneville can only bid from these aggregated projects if it operates its entire system in a way that "sets up" those big-10 resources to be able to bid. That is, with a run of river system water must be moved and stored in a coordinated fashion in order for the aggregated resources to be available.

Intended Resolution

Bonneville would need statutory expenditure authorization in order to directly purchase allowances under California's, and potentially other states', cap-and-trade programs. This authorization is important to Bonneville in order to be able to sell into evolving markets such as the EIM. The authorization would provide cost savings because Bonneville would not have to go through third-parties (and pay them) to access the California wholesale market. Additionally, the authorization is important because there is no guarantee that third parties will always be willing to provide this service to Bonneville. Finally, other states may also enact carbon pricing programs that place a compliance obligation on electricity, similar to California's program.

As indicated above, EIM participants can elect to not sell into California. In the event Congress does not authorize Bonneville to purchase allowances in time for participation in the EIM, Bonneville intends to opt out of selling directly into California via the EIM. In that case, no power would be deemed sold into California and Bonneville would not incur any

[434] *See* section 3.5.1.

BPA-2020-00784-F 0008

compliance obligations under the California cap-and-trade program because Bonneville would not be importing into California through the EIM. Bonneville recognizes that this could impact the value of participating in the EIM; however, the expectation is that this impact would be small.[435] If Congress authorizes Bonneville to purchase allowances at a later date, Bonneville can change its election and begin selling into California via the EIM at that time.[436]

Bonneville also identified another potential option for participation in the EIM, using a third party as the Participating Resource Scheduling Coordinator. Since CARB identifies the Participating Resource Scheduling Coordinator as the entity with the compliance obligation under the cap-and-trade program, if Bonneville utilized a third party, that party would take on the compliance obligation. In CARB's interpretation, the Scheduling Coordinator would be the "electricity importer" into California, thus they would be required to obtain carbon allowances and surrender them to CARB. This third party would theoretically be performing various tasks for Bonneville, which is important in ensuring Bonneville is getting additional value from the third party and this is not simply a direct pass-through to cover the costs of the carbon allowances. However, other than identifying this as a potential option, Bonneville has not explored whether it is feasible to use a third party as the Participating Resource Scheduling Coordinator, and what business value the third party might provide aside from eliminating Bonneville's CARB compliance obligation.

Bonneville's Proposal

Bonneville's policy proposal on carbon in the EIM is to opt out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to directly purchase allowances under California and other state carbon programs. Bonneville does not believe this issue precludes its participation in the EIM.

[435] *See* section 3.4.

[436] The fiscal year 2020 House Energy and Water Development Appropriations bill, which passed out of the full House Appropriations Committee on May 21, 2019, includes statutory language that would give Bonneville expenditure authorization to purchase these carbon allowances if enacted.

BPA-2020-00784-F 0008

Issue 3.5.4.1

Whether Bonneville should opt out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to purchase carbon allowances.

Commenters' Positions

Several commenters addressed Bonneville's proposal to opt out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to purchase allowances under California's cap-and-trade program. Commenters were uniformly supportive of this proposal.[437]

Evaluation of Positions

This issue is about whether Bonneville should, for the time being, deal with carbon in the EIM by opting out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to directly purchase allowances under California and other state carbon programs. The commenters that addressed this issue were uniformly supportive of Bonneville's approach. The approach is essentially the status quo and, as demonstrated by the commenter support, is not controversial. In addition, as stated in the Proposal, Congressional authorization to purchase carbon allowances would provide cost savings because Bonneville would not have to go through third parties to access the California market. Congressional authorization is also important because there is no guarantee that third parties will always be willing to provide this service to Bonneville. Finally, other states may also enact carbon pricing programs that place a compliance obligation on electricity, similar to California's program. Accordingly, while Congress debates this authorization, it is reasonable for Bonneville to continue its status quo practice by not selling into California via the EIM.

Decision

Bonneville's policy on carbon in the EIM will be to opt out of selling directly into California via the EIM unless Congress grants Bonneville the authority to directly purchase allowances under California and other state carbon programs.

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[437] *See* EWEB Comments at 1; PGP Comments at 1; Slice Group Comments at 6; Snohomish Comments at 2; WPAG Comments at 8.

BPA-2020-00784-F 0008

Issue 3.5.4.2

Whether the CAISO's GHG accounting rules have potential implications for Bonneville's Asset Controlling Supplier (ACS) emissions factor.

Commenters' Positions

Many commenters (EWEB, NRU, PGP, Snohomish, PPC, the Slice Group, WPUDA, and WPAG) voiced concerns about the current GHG accounting practices of the CAISO and CARB.[438] The commenters are concerned about the implications that such accounting may have for Bonneville's Asset Controlling Supplier emissions factor for imports into California and the carbon content of Bonneville's fuel mix. The Slice Group summarized the issue:

> The Slice Customer Group wishes to express its concerns with the accounting and treatment of carbon free resources in the EIM; specifically, CAISO's current methodology for determining which EIM participating resources are "deemed" to serve California load and are thus subject to California Air Regulatory Board greenhouse gas regulations. As noted in the Proposal, Bonneville's status as an Asset Controlling Supplier (ACS) with a low emissions factor, adds value to sales made by Bonneville into the California market. We understand the methodology can presume Bonneville's low emissions hydro is serving load within California, rather than load within Bonneville's own balancing authority, while simultaneously presuming that Bonneville's load is being served by EIM imports, even if no EIM energy transfers are occurring. Without modification to the existing GHG Accounting methodology for "deeming" which resources are dispatched into California, irrespective of actual flow of energy, the result could increase the amount of emitting or unspecified energy counted as "flowing" into the Bonneville Balancing Authority Area. Given the fact that EIM imports are considered "unspecified" from a carbon content perspective and allocated an Unspecified Source Emissions Factor, the result could be an increase or change to Bonneville's historically low ACS emission factor in subsequent years. Potential impacts could range from a reduction in the value of FCRPS sales into California due to a higher ACS emission factor, to an increase in reported emissions in the Bonneville fuel mix.[439]

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[438] *See* EWEB Comments at 2; NRU Comments at 5-6; PGP Comments at 1-3; Snohomish Comments at 2; PPC Comments at 7-9; Slice Group Comments at 6-7; WPUDA Comments at 4; WPAG Comments at 8.
[439] Slice Group Comments at 6.

BPA-2020-00784-F 0008

In related comments, the Slice Group recommends that "the impact of Bonneville's EIM imports and exports on Bonneville's ACS emissions factor calculation and any resulting impact on customer GHG compliance be added to the list of Phase III policy issues to be discussed further."[440] WPAG raises a similar comment.[441] EWEB and the Slice Group also state that "Bonneville should elect to not sell into California until the CAISO and the various stakeholders modify the existing GHG Accounting framework in such a way as to avoid the issues described above."[442] In addition, NRU raises a general comment that "NRU objects to BPA making a final policy decision on carbon obligations and related matters in the September 2019 Final ROD. Limited discussion has occurred on this issue and there are layers of complication that need to be explored before BPA can make a final policy decision."[443]

Evaluation of Positions

GHG accounting in the EIM is an evolving issue that Bonneville will continue to closely evaluate. Bonneville will actively engage with stakeholders to ensure fair treatment and valuation of the power provided by the low-carbon FCRPS. Bonneville closely follows the CAISO and CARB's processes on GHG accounting attributable to EIM imports into California. Bonneville supports the accurate accounting of GHG emissions and is aware that issues have been identified with the current methodology for GHG accounting for EIM imports into California in relation to hydro systems and entities with ACS status. PGP describes these issues:

> CAISO's market optimization assumes the resources with the lowest GHG bid adder cost are "deemed" to serve CAISO load, regardless of energy bid, actual dispatch, or EIM transfers that occur. EIM Participating Resources that opt to sell directly into California can be "deemed" to serve California load up to the MW value between the resource's base schedule and the resource's upper economic level. The result is that zero/low carbon resources, such as hydro resources, are predominantly "deemed" to serve California load for the MWs bid above their base schedule even if the resources are not dispatched above their base schedule. If the MW portion of the resource that was "deemed delivered" to California was originally included in the resource's base

[440] *Id.* at 7.
[441] *See* WPAG Comments at 8.
[442] *See* EWEB Comments at 2; Slice Group Comments at 6-7.
[443] NRU Comments at 5.

BPA-2020-00784-F 0008

schedule, that MW portion is "backfilled" with EIM imports, considered to be "unspecified" by CARB from a carbon content perspective.[444]

Bonneville acknowledges these GHG accounting issues and notes that they could become significant in the future. For now, most commenters' concerns focus on the GHG accounting resulting in an increase to Bonneville's historically-low ACS emissions factor.[445] Since the GHG accounting method for EIM imports into California and the ACS emissions factor are specific to California's cap-and-trade program, these accounting issues represent a relatively small potential impact to Bonneville's ACS emissions factor and to the value of Bonneville's secondary sales into California.

Apart from impacts on Bonneville's ACS emissions factor, PGP raises other concerns about the CAISO's GHG accounting. PGP states that these accounting issues could: (1) result in the true GHG cost of external resources serving load in California to go unaccounted; (2) result in the wrong dispatch and GHG accounting; and (3) when more low-carbon resources opt-in to serve California load, increase the likelihood that low carbon resources will be deemed the marginal GHG resource, which artificially lowers the GHG portion of the EIM LMPs.[446]

Bonneville appreciates that PGP has identified these issues, and Bonneville intends to be actively engaged with the CAISO and CARB to clarify how the accounting will work for Bonneville (both in terms of ACS emissions factor, as well as other issues such as those PGP has identified). Bonneville takes these issues seriously and, instead of adding these issues to Phase III, will continue to coordinate and collaborate with customers and stakeholders on these issues. However, Bonneville does not view these as issues that preclude a final decision on whether to opt out of selling directly into California via the EIM unless Congress grants Bonneville the authority to purchase allowances under California's cap-and-trade program. Even if Bonneville should receive such authority, Bonneville could still opt out of selling directly into California in the EIM in the future for other reasons (such as the CAISO and CARB's GHG accounting practices) should Bonneville determine it is in Bonneville's best interest to do so.

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[444] PGP Comments at 1-2; *see also* Slice Group Comments at 6.

[445] *See, e.g.*, Slice Group Comments at 6 ("the result could be an increase or change to Bonneville's historically low ACS emission factor in subsequent years."); PGP Comments at 3 ("an increase in BPA's carbon emissions factor reduces the value of the FCRPS for sales into the California market . . . ."). In contrast to the Slice Group's and PGP's comments, the OPUC and Oregon DOE point out that the EIM has the potential to "increase the dispatch of renewable energy and thereby reduce greenhouse gas emissions, which could help Oregon meet its climate goals," and that EIM participation will help BPA "monetize the carbon-free flexibility of the federal hydropower system." OPUC/ODOE Comments at 1.

[446] PGP Comments at 2-3.

BPA-2020-00784-F 0008

Decision

Bonneville recognizes that GHG accounting for EIM imports is an important, evolving issue; however, Bonneville has not identified it as an issue that precludes its participation in the EIM and, therefore, will not include it in Phase III. However, Bonneville will continue to coordinate closely with customers and stakeholders on this issue as it evolves. Bonneville remains committed to actively participating in ongoing and emerging state regulatory processes and new market development around GHG accounting and related issues. If Congress authorizes Bonneville to purchase allowances and Bonneville therefore is able to sell directly into California in the EIM, Bonneville will evaluate whether direct sales to California are cost effective based on current circumstances at that time.

Issue 3.5.4.3

Whether the GHG accounting practices in other states, such as Washington, will impact Bonneville's EIM participation.

Commenters' Positions

Several commenters were concerned with how GHG accounting practices may impact future obligations in other states.[447] Snohomish summarized the commenters' concerns:

> In the event Bonneville joins the EIM and its participation results in greater unspecified source imports to the Bonneville Balancing Authority Area than under previous bilateral market practices, customers with power supply agreements from Bonneville could expect the carbon content attributed to the Tier 1 System to increase. This, in turn, would affect the carbon content and fuel mix reported by Bonneville to its customers, like Snohomish, that have a forthcoming clean energy obligation (*e.g.*, Washington State's Clean Energy Transformation Act, enacted May 7, 2019).

Evaluation of Positions

The issue of GHG accounting in the context of the emerging Washington State statute and regulations is very new and not yet well defined. Furthermore, assessment of the impacts of GHG accounting for other potential future state GHG reduction policies is speculative and premature.

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[447] EWEB Comments at 2; NRU Comments at 6; PGP Comments at 3; PPC Comments at 7-8; Slice Group Comments at 6; Snohomish Comments at 2; WPAG Comments at 8.

BPA-2020-00784-F 0008

As Snohomish notes, Washington's Clean Energy Transformation Act was enacted recently, just weeks before Bonneville issued its Proposal on June 20th. It is therefore not yet entirely clear how this law will impact Bonneville's EIM participation and the associated carbon accounting. The specific concerns that commenters have raised will only become defined in rulemakings by the State of Washington. These rulemakings have just begun, and their outcome is far from certain. Thus, it is yet to be determined how the state of Washington will calculate the carbon content of Bonneville's fuel mix, how it may account for GHG emissions attributable to EIM imports into the state, and how such accounting may harmonize with practices in California. Consequently, it is unclear what implications, if any, EIM imports may have on the carbon attributed to Bonneville's fuel mix in other states (such as Washington) and how this may impact preference customers' abilities to meet their obligations under their state's GHG reduction policies.

As these issues unfold, Bonneville will be an active participant in the rulemakings on Washington's Clean Energy Transformation Act as well as other emerging state and federal GHG reduction regulatory processes. Bonneville takes these issues seriously and Bonneville's engagement on these issues includes close coordination and collaboration with preference customers and other stakeholders.

Decision

Bonneville will be an active participant in the rulemakings on Washington's Clean Energy Transformation Act as well as other emerging state GHG reduction regulatory processes. Bonneville's engagement on these issues will include close coordination and collaboration with preference customers and other stakeholders.

3.5.5 Local Market Power Mitigation/Default Energy Bid

Background

One of the primary objectives of electricity market design is efficient load service; that is, the deployment of lowest cost generation resources to serve loads recognizing transmission constraints. Achieving this efficiency requires a market design that prevents participants from exercising market power by raising market prices above otherwise competitive market outcomes.

The CAISO administers the Local Market Power Mitigation (LMPM) procedures set forth in the CAISO's Tariff to determine when and how to mitigate the impacts of a participant potentially exercising market power. The CAISO applies the LMPM procedures to the entire EIM footprint. Thus, if Bonneville joins the EIM, the CAISO's LMPM procedures will apply to EIM dispatches into and out of Bonneville's balancing authority area. As discussed

BPA-2020-00784-F 0008

further below, Bonneville has serious concerns with the CAISO's current LMPM procedures and their impact on Bonneville's potential EIM participation with its hydro resources.

Today, if an EIM participant is determined to have market power, the CAISO may mitigate the participant's bid(s) to a Default Energy Bid (DEB), which is used in the CAISO's optimization (or market run). Presently, market participants may choose from three options in determining their DEB:

1. *Variable Cost Option*:[448] Based on heat rate, fuel price, GHG costs, etc.;
2. *Locational Marginal Price (LMP) Option*:[449] Based on lowest 25th percentile of LMPs at which a Participating Resource was dispatched in the last 90 days; or
3. *Negotiated Rate Option*:[450] Based on a formula bilaterally negotiated between a Participating Resource Scheduling Coordinator and the CAISO/DMM.

Bonneville's Concerns Regarding the CAISO's Current LMPM Procedures

Bonneville has several concerns regarding the CAISO's current LMPM procedures. First, the procedures do not adequately address energy limited hydro systems, such as the FCRPS.[451] While existing options may be sufficient to approximate the marginal cost of supply for most thermal-based resources in the EIM footprint, the existing options do not capture the forward-looking nature of the opportunity cost of hydro generation.[452]

Bonneville also believes that the duration of a DEB under the current procedures is unnecessary. Currently, if a participant is determined to have market power, it would be mitigated throughout the remainder of the operating hour, instead of just the specific 15-minute interval(s) in which the participant is determined to have market power.

Finally, Bonneville is concerned that the application of existing DEBs has been known to induce unintended flows between EIM Entity balancing authority areas or result in incremental transfers beyond the transfers modeled in unmitigated market runs. This has the potential to discourage additional EIM participation.

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[448] CAISO Tariff § 39.7.1.1.
[449] *Id.* at § 39.7.1.2.
[450] *Id.* at § 39.7.1.3.
[451] An energy limited hydro system is one in which the binding constraint is fuel (water) rather than a limit derived by machine-rated (nameplate) capacity.
[452] Opportunity costs for hydro resources should include the value of future generation that is forgone due to market dispatches in the present- or near-term.

BPA-2020-00784-F 0008

The CAISO's Proposed Modifications to its LMPM Procedures

The CAISO initiated an LMPM stakeholder initiative in September 2018 addressing the issues discussed above.[453] Bonneville and other Pacific Northwest parties with hydro resources actively participated in that initiative to persuade the CAISO to develop a default energy bid formulation for hydro resources with storage capability and to enhance other components of the LMPM procedures.

Bonneville views the outcome of the LMPM stakeholder initiative as favorable to Bonneville and other Pacific Northwest hydro generation parties. Enhancements to the LMPM procedures included:

1. A fourth DEB option that more accurately reflects the opportunity costs of hydro resources. The fourth DEB option includes:
    a. A formula that incorporates the forward storage horizon of a Participating Resource;
    b. A multiplier that recognizes the inherent variation of prices and a Participating Resources' ability to target or shape its output to the highest value periods;
    c. Inclusion of a price floor based on a gas turbine heat rate meant to proxy a replacement power purchase;
    d. Recognition of the combined value of energy and firm transmission rights when coupled together for delivery; and
    e. The ability to update parameters of the DEB, such as multiplier levels, upon request.
2. Market power mitigation will occur for only the 15-minute interval(s) when market power is determined to exist instead of the entire operating hour.
3. Market rules will limit transfers between two EIM balancing authority areas to a specified amount so that unintended market flows due to mitigation are minimized.

On July 2, 2019, the CAISO filed with FERC for approval certain revisions to its Tariff incorporating these modifications to its LMPM rules.[454] Bonneville intervened, filed

[453] For more information regarding the CAISO's 2018 LMPM Enhancements stakeholder initiative, see http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalMarketPowerMitigationEnhancements2018.aspx.
[454] *CAISO*, FERC Docket No. ER19-2347-000, *available at* http://www.caiso.com/Documents/MotiontoInterveneandCommentsoftheDepartmentofMarketMonitoring-LMPME-ER19-2347-000-Jul232019.pdf.

BPA-2020-00784-F 0008

comments in support of the CAISO's proposed tariff revisions, and is closely following that proceeding.[455]

Bonneville's Proposal

Bonneville is satisfied with the outcome of the CAISO's LMPM stakeholder initiative and the substance of the LMPM enhancements to the CAISO's Tariff filed with FERC. The issues raised by Bonneville and other Pacific Northwest parties with hydro resources were largely addressed in a satisfactory manner during the CAISO's stakeholder initiative process. That said, Bonneville will closely monitor the CAISO's Tariff filing proceeding before FERC. If FERC approves the current draft language, Bonneville will consider the proposed enhancements sufficient to address its current concerns with the CAISO's current LMPM procedures. If FERC does not approve the CAISO's proposed Tariff language or significantly modifies it, Bonneville will revisit the LMPM issue and determine whether it will pursue joining the EIM using the negotiated DEB option.

Issue 3.5.5.1

What should Bonneville's position be regarding the CAISO's Local Market Power Mitigation procedures?

Commenters' Positions

Several commenters support the fourth DEB option and the market mitigation enhancements that the CAISO has filed with FERC.[456] PPC and Governor Inslee support Bonneville making FERC approval and the CAISO implementation of the fourth DEB a condition of Bonneville's participation in the EIM.[457] NWEC and NRU stated that it is also important to assess the CAISO's implementation of the new DEB and the effect it has on Northwest EIM participants to ensure it does not have unintended consequences.[458] NRU and Snohomish request that if FERC does not approve the LMPM language as proposed, Bonneville should revisit the issue with its customers to see if Bonneville should still join the EIM.[459]

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[455] Bonneville's Motion to Intervene and Comments, FERC Docket No. ER19-2347-000, *available at* https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15313637.
[456] NWEC Comments at 4; Governor Inslee Comments at 2; Seattle Comments at 3; NRU Comments at 6; Snohomish Comments at 4; PPC Comments at 8; WPUDA Comments at 3-4.
[457] PPC Comments at 8; Governor Inslee Comments at 2.
[458] NWEC Comments at 4; NRU Comments at 6.
[459] NRU Comments at 6; Snohomish Comments at 4.

BPA-2020-00784-F 0008

Evaluation of Positions

Commenters recognize the importance of the LMPM issue and the need for FERC approval of the CAISO's filing. As stated by Governor Inslee,

> Because the effective management of the FCRPS and the opportunity under the EIM to increase revenues from sales of surplus hydropower are critical to BPA's participation decision, I support BPA's proposed condition that FERC approve and CAISO implement the proposed enhancements to EIM market power mitigation processes. The implementation of such enhancements is necessary to ensure that the EIM and California markets appropriately recognize the value of the Northwest's significant flexible, renewable, and carbon-free hydropower resources.[460]

If FERC approves the CAISO's LMPM filing, the new DEB and other LMPM enhancements will be in place prior to Bonneville making a final decision in the Close-Out Letter (Phase V) to go live in the EIM. Consistent with the comments of NWEC and NRU,[461] Bonneville will monitor the implementation and effect of the new DEB to ensure that there are no unintended consequences or other reasons for concern.

Bonneville expects FERC to approve the LMPM filing, but if FERC does not approve the fourth DEB, Bonneville will seek to negotiate a DEB specific to its resources. As NRU and Snohomish request in their comments, Bonneville would be transparent about pursuing a negotiated DEB and would revisit whether Bonneville should proceed with joining the EIM.

Decision

The enhancements to the CAISO's Local Market Power Mitigation procedures filed this summer with FERC for approval are sufficient to address Bonneville's concerns regarding the current LMPM procedures. Bonneville will continue to monitor the progress of the enhancements through FERC's approval process and, if approved, the CAISO's implementation process. If the proposed enhancements are not approved or are substantially revised by FERC such that Bonneville's concerns are no longer addressed, Bonneville will seek to negotiate a DEB specific for Bonneville and will reconsider whether (or how) it will join the EIM if a negotiated DEB is unacceptable.

[460] Governor Inslee Comments at 2.
[461] NWEC Comments at 4; NRU Comments at 6.

Issue 3.5.5.2

Should Bonneville seek to have additional inputs for the fourth DEB?

Commenters' Positions

WPUDA supports the addition of the fourth DEB option, but questions whether the negotiated default energy bid option is sufficient to deal with the consequences of Washington's Clean Energy Transformation Act.[462] WPUDA states that the Act will likely limit thermal resources to periods needed for reliability and thus these resources will need to recover their operating costs over fewer hours of operation. WPUDA is concerned that if these costs are not included in a negotiated DEB, Northwest customers may end up paying for capacity that is used to support out of region energy needs.[463]

Evaluation of Positions

Bonneville understands WPUDA's concern regarding the implications Washington's Clean Energy Transformation Act might have for the market when the operation of some thermal resources is restricted, and Bonneville agrees that the CAISO's EIM LMPM may need to account for these changes in the future. It should be noted that while the Act has been approved, the details of its implementation still need to be developed by the Washington Utilities and Transportation Commission. Puget Sound Energy and PacifiCorp are already EIM Entities with thermal resources bidding into the EIM. The effects of limiting thermal resource generation from the Act should be apparent before Bonneville joins the market, and Bonneville will be supportive of needed adjustments to the CAISO's EIM LMPM rules that provide for fair compensation for thermal resources affected by the Act.

Decision

Bonneville will closely monitor the development of the implementation of Washington's Clean Energy Transformation Act and any effects it may have on the EIM. If thermal generators are not being adequately compensated through the EIM DEB, Bonneville will be supportive of a negotiated default energy bid that accounts for limitations from the Act.

[462] WPUDA Comments at 3-4.
[463] *Id.*

BPA-2020-00784-F 0008

3.5.6 Load Aggregation

Background

A load aggregation point (LAP) is a weighted average of multiple locational marginal price nodes used for the settlement of non-participating load imbalance[464] in an EIM Entity's balancing authority area.

Bonneville staff has discussed load modeling with the CAISO and has benchmarked other EIM Entities regarding how they model their loads. To date, every EIM Entity has chosen to use a single LAP for their respective balancing authority areas.[465] The consensus is that having a single LAP reduces workload, costs, and complexity because having multiple LAPs requires different load forecasts, prices, meters, and uninstructed imbalance energy settlements[466] for each LAP. The reason to have multiple LAPs would be if there is significant weather variation across a balancing authority area resulting in dramatically different demand forecast patterns, or significant and persistent congestion across subsystem boundaries resulting in significantly different prices for multiple LAPs.

Bonneville's Proposal

In its Proposal, Bonneville proposed to initially have one load aggregation point (LAP) if it becomes an EIM Entity. A single LAP for Bonneville's entire balancing authority area would be easier to manage from both an operational and settlements perspective and have less initial startup costs than designing systems to accommodate multiple LAPs. This, however, does not preclude Bonneville from deciding later to pursue a multiple LAP model as it gains more experience in the EIM.

Issue 3.5.6.1

How should Bonneville approach load aggregation?

Commenters' Positions

NRU and PPC agree with Bonneville's proposal to use one LAP, and PPC points out that this approach is consistent with the approach of every EIM Entity to date.[467] NRU states that

[464] Non-participating load is load that does not have an economic bid in the EIM.
[465] PacifiCorp has separate LAPs for its PAC-East and PAC-West balancing authority areas. *See PacifiCorp,* 147 FERC ¶61,227, at P 15 (2014).
[466] Uninstructed energy imbalance is comparable in principle to Bonneville's Energy Imbalance service today.
[467] NRU Comments at 7; PPC Comments at 8.

BPA-2020-00784-F 0008

any change to this approach needs to be made in a formal public process that includes customer comments.[468]

Evaluation of Positions

The one LAP approach is consistent with other EIM Entities, and changing to multiple LAPs would be a significant change with potential impacts to multiple parties in the Bonneville balancing authority area. If Bonneville changes the one LAP approach, there would be a transparent public process to evaluate the need for more than one LAP and to understand the potential impacts.

Decision

Bonneville will initially have one LAP.

3.5.7 Resource Sufficiency – Balancing Authority Area Level

Background

The CAISO uses a resource sufficiency (RS) evaluation to determine whether each EIM Entity has procured, prior to each operating hour, sufficient energy, capacity, flexibility, and transmission to serve imbalance in its own balancing authority area.[469] The objective of the RS evaluation is to ensure that an EIM Entity does not lean on other EIM Entities in real-time to serve imbalance in its balancing authority area.

The CAISO's real-time RS evaluation for the EIM is not a longer-term resource adequacy program as applied to the CAISO's other markets. The CAISO does not enforce any resource adequacy requirements as part of its RS evaluation, and there are no resource adequacy standards applicable to the EIM. There are no capacity payments or must-offer obligations associated with RS. Moreover, outcomes of the RS tests are not determinative as to whether an EIM Entity is meeting applicable NERC reliability standards. An EIM Entity could fail RS and still meet applicable NERC reliability standards.

As shown in the table below, the CAISO evaluates each EIM Entity for RS every hour in real-time using four tests, which are performed sequentially. The RS evaluation determines if an EIM Entity is allowed to participate in the EIM to optimally serve its imbalance needs. If an EIM Entity fails RS, it must rely on its own resources, including any bilateral

[468] NRU Comments at 7.
[469] For a more in-depth discussion of the CAISO's RS evaluation and process, see Bonneville's stakeholder materials dated January 16, 2019, which can be viewed at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190119-EIM%20Stakeholder%20Mtg.pdf.

BPA-2020-00784-F 0008

arrangements with external resources and limited interaction with the EIM to meet its imbalance. Capacity held for balancing authority operational requirements is not considered as part of the capacity needed to meet RS requirements.

RS TEST	DESCRIPTION	CONSEQUENCES OF FAILURE
Transmission Feasibility Test	Identifies if an EIM Entity's base schedules are limited by congestion	None— advisory only.
Balancing Test	Ensures that an EIM Entity's load/ resources are balanced going into the hour	Failure does not result in limitations on EIM transfers but will be used to determine if an EIM Entity is evaluated for over/under scheduling penalties.
Bid Range Capacity Test	Ensures that the EIM Entity has bid range to cover expected imbalance	An EIM Entity can fail in one or both directions (import and export) for a 15-minute market interval. Failure of capacity test in a given direction results in failure of the Flexible Ramp Sufficiency test in the same direction.
Flexible Ramp Sufficiency Test	Ensures the EIM Entity has ramping capability to meet expected load ramp and uncertainty	An EIM Entity can fail in one or both directions (import and export) for a 15-minute market interval. Failure results in EIM transfers being limited in the failed direction for that interval.

Impacts of the CAISO's RS Evaluation on Bonneville

While Bonneville has not determined how it will bid flexibility in an EIM, Bonneville's preliminary analysis indicates that it would pass the RS evaluation a significant amount of the time using historical spinning availability. This provides Bonneville with a high level of confidence that it can achieve the benefits described in the business case. The likelihood of passing the RS evaluation would increase if any additional bid flexibility is made available, whether from federal or non-federal Participating Resources.

Bonneville's Proposal

In the Proposal, Bonneville proposed a finding that the CAISO's resource sufficiency standards are not an impediment to Bonneville participating in the EIM.

BPA-2020-00784-F 0008

Issue 3.5.7.1

Whether the CAISO's resource sufficiency requirements are an impediment to Bonneville participating in the EIM.

Commenters' Positions

WPUDA is concerned that the current EIM market design may result in Bonneville resources being undercompensated for the value they provide. First, WPUDA questions whether the P95 confidence used in the RS Bid Range Capacity Test will allow entities to be capacity short 5% of the time, potentially when capacity is most constrained. Second, WPUDA is concerned that because the CAISO's EIM Flexible Ramp Sufficiency Test only ensures that each participating entity has sufficient upward/downward capacity to meet the forecast change in load at the end of each 15-minute interval, there is the potential for EIM Entities that pass the test to lean on others within the 15-minute interval.[470]

Evaluation of Positions

No commenter questioned Bonneville's assessment in the Proposal as to whether the CAISO's resource sufficiency standards are an impediment to Bonneville participating in the EIM. WPUDA's comments are focused on concerns about whether Bonneville will be compensated appropriately for the capacity that it brings to the market and whether the EIM RS tests are adequate to prevent leaning.[471]

WPUDA's concern regarding the P95 confidence requirement in the RS Bid Range Capacity Test allowing EIM entities to be short on capacity bid into the market 5% of the time resulting in Bonneville being undercompensated is a valid question. However, it is important to recognize that the EIM is only an energy market, and there is no capacity payment associated with EIM transactions. Currently, the only RS requirements applicable to Bonneville's balancing authority area are those that come with the NERC reliability rules that have no capacity quality of service standards (*i.e.*, the P95 confidence requirement). Under today's paradigm there is a potential of neighboring balancing authority areas being short on capacity to support their own needs within the hour by leaning on others, and there is no direct financial compensation for the energy or the capacity that may inadvertently flow between balancing authority areas. In the EIM, EIM Entities are held to common minimum capacity standards through the CAISO's RS requirements. When called

[470] WPUDA Comments at 3.
[471] *Id.*

BPA-2020-00784-F 0008

on to support load in other balancing authority areas in the EIM footprint, EIM Entities are compensated at a market price for the energy component of that support.

As Bonneville recognized in the Proposal, the EIM is one part of a well-functioning market. Bonneville wants to see a capacity market developed that recognizes the full value of the flexibility that generators such as the FCRPS can provide to the integrated system.[472] Another place Bonneville is attempting to get added value for capacity is through enabling EIM Entities to enter into bilateral contracts with other EIM Entities for capacity to help them meet their EIM resource sufficiency requirements. This potential improvement is included in section 14(h)(ii) of the Implementation Agreement.[473] While Bonneville agrees with WPUDA that it should be compensated for capacity, Bonneville does not believe that seeking a change to the current structure of the resource sufficiency tests, outside of the improvement set forth in section 14(h)(ii), is the best way to achieve these goals.

Bonneville does not see WPUDA's second issue regarding EIM Entities passing the Flexible Ramp Sufficiency Test (FRST) in the 15-minute interval, but still leaning on Bonneville's resources within the 15-minute interval, as a viable concern. The evaluation of the FRST considers both the change in load and uncertainty. Under the FRST, EIM Entities are required to demonstrate that they can cover all 15-minute forecasted load changes and P95% confidence of the variability between the 5- and 15-minute markets. The resources needed to pass the FRST will be available to the market, and thus are available in the 5-minute market. Other EIM Entities are not able to withdraw the resources committed to meet the FRST, so there is no risk of parties leaning on the FCRPS within the 15-minute interval. As stated above, if FCRPS resources are called on by the EIM to serve load in other balancing authority areas, Bonneville will be compensated for the energy provided. In addition, the only FCRPS resources that will be available to the market are those that Bonneville voluntarily bids into the market. Bonneville will only bid generation into the market that it intends for the market to use, and therefore leaning is not a concern.

Decision

The CAISO's resource sufficiency requirements are not an impediment to Bonneville participating in the EIM. Modifying the CAISO's resource sufficiency rules, except as provided in section 14(h)(ii), is not an appropriate approach to ensure Bonneville is compensated for capacity, and other parties leaning on the Federal power system should not be an issue in the EIM.

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[472] Proposal, Administrator's Cover Letter, at 2-3; *see also* Administrator's Preface, above.
[473] *See* Proposal, Attachment C, at 14.

BPA-2020-00784-F 0008

4.0 EIM Implementation Agreement

4.1 Background

An EIM Implementation Agreement is the first in a series of agreements necessary for a balancing authority to become an EIM Entity.[474] In general terms, an Implementation Agreement establishes a high-level project plan and schedule that sets forth the steps that a balancing authority and the CAISO must take in order for a balancing authority to join the EIM. However, the Implementation Agreement does not obligate a balancing authority to join the EIM.

The Implementation Agreement also requires a prospective EIM Entity to fund a portion of the CAISO's already incurred EIM-related startup costs. To ensure the fair and equitable allocation of such costs, the funding amount set forth in each Implementation Agreement is based on a formula that considers the percentage of a prospective EIM Entity's total balancing authority net energy for load (NEL)[475] as part of the total NEL in the entire WECC footprint. The CAISO then uses this percentage to allocate its total estimated start-up costs for the EIM to each prospective EIM Entity in the Implementation Agreement.[476] The CAISO's total estimated startup costs for the EIM include:

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[474] Following an EIM Implementation Agreement, the CAISO and prospective EIM Entity must execute an EIM Entity Agreement, EIM Scheduling Coordinator Agreement (if the Entity is serving as its own Scheduling Coordinator), meter agreement, and other potential agreements as necessary. For more information regarding the agreements that are necessary in the EIM, please see https://www.westerneim.com/Documents/EIMTrack2Overview-Agreements.pdf.

[475] NERC defines NEL as "net generation of an electric system plus energy received from others less energy delivered to others through interchange. It includes system losses but excludes energy required for the storage of energy at energy storage facilities." NERC Rules of Procedure, Definitions, Appendix 2, *available at* https://www.nerc.com/FilingsOrders/us/RuleOfProcedureDL/Appendix_2_ROP_Definitions_06082018.pdf

[476] The CAISO files each executed Implementation Agreement with FERC for approval. The filing of the Implementation Agreement includes a declaration from a CAISO representative that outlines the basis for and allocation of the CAISO's estimated EIM startup costs to EIM Entities in the agreement. The Commission has found the CAISO's cost-allocation mechanism to be just and reasonable and approved it accordingly. *See, e.g., CAISO*, 143 FERC ¶ 61,298, at PP 31-36 (2013) (the Commission's acceptance of the CAISO's cost allocation of EIM startup costs in PacifiCorp's Implementation Agreement).

BPA-2020-00784-F 0008

CAISO Estimated EIM Start-Up Costs (in thousands of dollars)	
Licenses	12,150
EMS system improvements	1,000
Data storage	2,000
Necessary hardware upgrades	500
Production software modifications	1,000
Network configuration and mapping	500
Integration	500
Testing	1,500
System performance tuning	250
Training and operations readiness	150
Project management	150
Total	**19,650**

The Implementation Agreement terminates on its own terms when an EIM Entity "goes live" in the EIM, meaning when market transactions become financially binding. Subsequent agreements such as the EIM Entity Agreement and EIM Entity Scheduling Coordinator Agreement, which are signed before an EIM Entity's go live date, continue in effect so long as a balancing authority is participating in the EIM. A prospective EIM Entity can terminate the EIM Implementation Agreement on 30 days' written notice and is only responsible for paying the costs associated with milestones accomplished at the time written notice is provided. In addition, the CAISO will work with a prospective EIM Entity to extend the Agreement if additional time is necessary for implementation.

4.2 Bonneville's Implementation Agreement with the CAISO

Bonneville's Proposal

In the Proposal, Bonneville proposed signing the Implementation Agreement included in Exhibit C concurrent with the publication of this Record of Decision. The agreement is generally similar in substance and form to all other Implementation Agreements that have been negotiated and executed by the CAISO and other existing or prospective EIM Entities. That said, Bonneville's Implementation Agreement does have some unique provisions, which are addressed in more detail below.

Bonneville's funding requirement set forth in the Implementation Agreement is $1.87 million. As discussed in the preceding section, this represents Bonneville's proportional share of the CAISO's total estimated start-up costs for the EIM based on Bonneville's NEL within the WECC footprint.[477] As set forth in section 4(c) and Exhibit A of

[477] Bonneville's $1.87 million payment was calculated as follows:

BPA-2020-00784-F 0008

the Implementation Agreement, Bonneville will make six equal payments to the CAISO tied to particular project milestones.

Bonneville's Implementation Agreement also includes language regarding FERC's lack of jurisdiction over Bonneville in section 1(e) that is comparable to the language used by other non-jurisdictional entities in their Implementation Agreements.

Bonneville-Specific Language in the Implementation Agreement

Section 14 of Bonneville's Implementation Agreement contains several provisions specific to Bonneville's implementation efforts and its potential participation in the EIM. The provisions described below that are applicable to Bonneville's potential participation in the EIM will be memorialized in subsequent participation agreements, such as the EIM Entity Agreement.

1. *Statutory, Regulatory, and Contractual Requirements*. This provision provides that Bonneville's EIM implementation and participation will be consistent with its statutory, regulatory, and contractual requirements. For more information regarding these requirements, please see section 3.2.

2. *Voluntary Market Participation*. This provision provides that Bonneville's EIM participation will be predicated on rules voluntarily allowing market entry and exit, voluntarily submitting bid and offer volumes and pricing, voluntarily donating transmission for EIM Transfers, and voluntarily foregoing EIM Transfers in one or more specified operating intervals consistent with the CAISO and Bonneville Tariffs. As described in several other sections of this ROD, the voluntary nature of EIM participation will be a key consideration of Bonneville's ultimate decision regarding whether to join the EIM.

3. *Reliability and Operation of the Federal Power and Transmission Systems*. This provision provides that Bonneville retains authority over matters relating to

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1. To determine a per MWh charge for creating and implementing the EIM outside of the CAISO's balancing authority area assessed to all prospective EIM Entities, the CAISO's estimated EIM startup cost of $19,650,000 million was divided by the total WECC-wide NEL, excluding the CAISO's NEL, of 636,200,000 MWh which equals $.031 per MWh. The CAISO's EIM startup costs are set forth above.
2. To determine Bonneville's share of the CAISO's startup costs, Bonneville's NEL of 60,000,069 MWh was then multiplied by the .031 MWh, which equals $1,869,302 (or rounded to $1.87 million).

The NERC data used for these calculations can be accessed at: https://www.nerc.com/gov/bot/FINANCE/2018%20NERC%20Business%20Plan%20and%20Budget%20%20Final/2018%20Assessments_2016%20NEL_FINAL_8.18.17.pdf.

BPA-2020-00784-F 0008

reliability and operation of the FCRPS and FCRTS. As described in section 3.5.3, Bonneville will retain its existing reliability tools.

4. *Federal Generation Participation*. This provision allows Bonneville to utilize the CAISO's resource aggregation models for EIM participation. As discussed in section 3.5.1, Bonneville is proposing to join the EIM using three aggregated Participating Resources.

5. *Automation Support*. This provision states that the CAISO will provide technical support as Bonneville works to automate many of the interactions with existing EIM interfaces during the implementation phase. Bonneville has identified the following interactions for potential automation: declaring contingency events, manual dispatches, load biasing, and setting EIM transmission interface operating limits. Bonneville continues to scope what interactions it will seek to automate.

6. *Greenhouse Gas Attributes.* This provision provides that if Bonneville allows FCRPS energy to be delivered directly to California in the EIM, those deliveries will be consistent with California's Cap and Trade program and may include Bonneville's status as an Asset Controlling Supplier. For more information regarding Bonneville and California's carbon policy, see section 3.5.4.

7. *Base Schedule Submission Timeframes*. This section provides that the CAISO will pursue changing the market closing timeline for financially binding hourly resource plans from T-40 to T-30. Bonneville believes this change will provide benefits to its stakeholders, particularly customers holding Slice power sales contracts.

8. *Consideration of Other EIM Enhancements*. This section includes four potential enhancements that Bonneville will propose in the CAISO policy-making process. While Bonneville's participation is not expressly contingent upon these enhancements, Bonneville believes these are important enhancements to the EIM that should be considered by the CAISO. The CAISO will explore these enhancements with Bonneville and other interested stakeholders. These enhancements include:

    a. *Improving the accuracy of hourly resource plans*. This section focuses on certain market design enhancements that would improve the accuracy of hourly resource plans and, in turn, help EIM Entities meet their respective resource sufficiency obligations.

BPA-2020-00784-F 0008

b. *Permit resource sufficiency obligation transfers, e.g., bid range transfers.* This section focuses on allowing an EIM Entity to bilaterally negotiate a transfer of capacity to another EIM Entity to help the latter Entity meet its resource sufficiency obligations.

c. *Improve the flexible ramping sufficiency test.* This section focuses on enhancements improving the flexible ramping sufficiency test, such as the incorporation of VER forecasts into the flexible ramping requirement computation.

d. Increase transparency of data required for validation of EIM settlement statements. This section focuses on exploration of appropriate methods for the CAISO to share additional market data with EIM Entities to allow them to fully validate the EIM settlement statements they receive from the CAISO.

Issue 4.2.1

Whether Bonneville should execute the Implementation Agreement attached as Exhibit C in the Proposal.

Commenters' Positions

Commenters overwhelmingly expressed support for Bonneville executing the EIM Implementation Agreement.[478] EWEB, for example, states that it "enthusiastically supports BPA's decision to sign the EIM Implementation Agreement," and Renewable Northwest states that it "strongly support[s] the Administrator's recommendation that Bonneville sign the Implementation Agreement."[479] No commenter explicitly disagreed with Bonneville's proposal to sign the EIM Implementation Agreement.

With respect to section 14(g) of the Implementation Agreement, which contains the CAISO's commitment to pursue changing the market closing timeline for financially binding hourly resource plans from T-40 to T-30, Seattle requests three points of clarification. First, Seattle requests Bonneville further explain how moving the current T-40 market closing timeline to T-30 will benefit customers. Second, Seattle asks why Bonneville is

[478] AWEA Comments at 1; AWEC Comments at 1; Clatskanie Comments at 1; EWEB Comments at 1; Galle Comments at 1; Governor Inslee Comments at 1; National Grid Comments at 1; NWEC Comments at 1; NRU Comments at 1; NV Energy Comments at 1; PNGC Comments at 1; PPC Comments at 8; Renewable Northwest Comments at 1; Seattle Comments at 4; Slice Group Comments at 1; Snohomish Comments at 1; Tacoma Comments at 1; WPAG Comments at 9.
[479] EWEB Comments at 1; Renewable Northwest Comments at 1.

BPA-2020-00784-F 0008

prioritizing this market enhancement over other possible enhancements. Finally, Seattle requests clarification as to whether Bonneville's participation is contingent upon this enhancement.[480]

Seattle also requests Bonneville further explain why the enhancements identified in section 14(h) are a priority for Bonneville and how they are helpful to Bonneville's customers. Seattle requests that Bonneville engage stakeholders regarding these and any other enhancements.[481]

Finally, Seattle requests clarification as to why the Implementation Agreement does not include any discussion regarding the day-ahead flexible ramping product given the amount of discussion regarding the product in the Proposal.[482]

The Slice Group specifically supports the inclusion of section 14(e) regarding automation support. It also supports the inclusion of section 14(g) regarding moving the market closing timeline from T-40 to T-30.[483]

Adcock asserts that the Implementation Agreement should explicitly state that neither the CAISO nor Bonneville will take any action that violates regional preference or that causes further damage to salmon.[484]

Evaluation of Positions

Bonneville appreciates stakeholder comments on its proposal to sign the Implementation Agreement and is encouraged by the overwhelming number of supportive comments to execute the agreement concurrent with the publication of this Record of Decision.

With respect to Seattle's requested clarification regarding moving the T-40 market closing timeline to T-30 set forth section 14(g), Bonneville clarifies that moving the market closing timeline closer to the delivery hour results in more efficient market outcomes for all customers because there is more certainty with respect to load, generation, and risk. Furthermore, Bonneville also negotiated for this enhancement to help address scheduling concerns regarding the Slice product. The Slice contract allows Slice customers to make schedule changes to T-30 which, obviously, is well after the current T-40 EIM market

[480] Seattle Comments at 3.
[481] *Id.* at 4.
[482] *Id.*
[483] Slice Group Comments at 7.
[484] Adcock Comments at 1.

BPA-2020-00784-F 0008

closing timeline occurs.[485] Moving the EIM market closing timeline closer to the T-30 scheduling deadline should help alleviate some concerns regarding uncertainty.

In regard to the prioritization of changing the T-40 to T-30 market closing timeline, Bonneville emphasized its importance during negotiations with the CAISO and obtained a commitment from the CAISO memorialized in section 14(g) that the CAISO will pursue this change before Bonneville goes live in the EIM. It is not correct to characterize (or assume) that Bonneville's prioritization of this issue resulted in a lessening of the priorities of other issues. During negotiations with the CAISO, Bonneville prioritized and negotiated issues based on their importance to Bonneville and its customers, and implementation feasibility.

While Bonneville's participation is not contingent upon a change of the T-40 market closing timeline to T-30, the CAISO knows and understands the relative importance to Bonneville and its customers of changing the timeline. This is an issue of heightened importance to Bonneville because it will result in more efficient market outcomes.

Section 14(h) memorializes four potential enhancements that Bonneville wanted to explicitly identify in the Implementation Agreement through negotiations with the CAISO. As noted above, while Bonneville's participation is not expressly contingent upon these enhancements, Bonneville believes they are important to the EIM and should be considered by the CAISO. The description set forth above for each enhancement describes its value (or benefit) and why Bonneville sought to explicitly include it in the Implementation Agreement. If stakeholders want additional details regarding these enhancements beyond what is provided in this Record of Decision, Bonneville is willing to discuss them further with stakeholders.

As Seattle notes, the Implementation Agreement does not contain any discussion of the day-ahead flexible ramping product (FRP), which is a market enhancement being considered in Phase II of the CAISO's Day-Ahead Market Enhancement (DAME) initiative. The Implementation Agreement addresses enhancements to the EIM that Bonneville

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[485] Notably, the Slice Group filed comments supporting the language in section 14(g). *See* Slice Group Comments at 7:

> The [Slice Group] supports specification of Base Schedule Submission Timeframes in the Implementation Agreement and the proposed modification of the market closing timeline for financially binding hourly resource plans from T-40 to T-30. As noted in the Proposal, this is specifically relevant to attaining consistency with current scheduling timelines for Slice power sales contracts. While modifying the market closing timeline is a positive change for Bonneville's participation in the EIM, it may not resolve all schedule related issues. As noted in comment #10 below, the [Slice Group] suggests that specific impacts to Bonneville's power and transmission products and services be added to the list of Phase III policy issues to be discussed further.

BPA-2020-00784-F 0008

believes should be a priority and impactful to Bonneville's participation in the EIM. The FRP is an enhancement to the CAISO's day-ahead market (outside of the EIM) and thus not within the scope of an EIM Implementation Agreement. That said, as stated above, Bonneville views flexible capacity products such as the FRP as one piece of a well-designed energy market. As discussed in section 1.4, Bonneville is actively participating in the DAME initiative and is strongly advocating for the CAISO to adopt and implement the FRP. In fact, Bonneville has made it clear that it expects that the CAISO will complete its stakeholder process and FRP will be implemented before Bonneville goes live in the EIM.

Finally, in response to Adcock's request that Bonneville explicitly state in the Implementation Agreement that neither the CAISO nor Bonneville will take any action that violates regional preference or that causes further damage to salmon, Bonneville believes such language in the agreement is unnecessary. (For the purposes of this response, Bonneville assumes that the phrase "take any action that further increases damages to salmon" refers to actions that are inconsistent with the applicable regulatory requirements associated with salmon.) Bonneville's first participation principle, memorialized in section 14(a) of the Implementation Agreement, requires that Bonneville's EIM participation be consistent with applicable statutes, regulations, and contractual requirements. Thus, the concern expressed by Adcock is adequately addressed in the Implementation Agreement.

Decision

Bonneville will sign the EIM Implementation Agreement, Attachment A to this ROD, concurrent with the publication of this Record of Decision.[486]

[486] Bonneville notes three small, non-substantive changes to the EIM Implementation Agreement after it was published on June 20, 2019. First, the phrase "as allowed by law" was added to section 5(g) to ensure that no party is obligated to return or destroy confidential information where prohibited by law. The Federal Records Act (18 U.S.C. Ch. 33), for example, may prohibit Bonneville from immediately destroying confidential information upon the CAISO's request. Second, section 6(b) was revised to clarify that actions under the Federal Tort Claims Act must be brought against the United States, not Bonneville. Third, Milestone 6 in Attachment C was changed to further clarify that the Implementation Agreement covers implementation work up to, but not beyond, the Go Live date, which is consistent with the term of the agreement set forth in section 1(c).

Milestone 6—Final preparation for System Deployment and Go Live with a target of no later than 3/2/2022. ~~Implementing the Project and going live~~This milestone will include resource registration, operating procedures and updates, execution of service agreements, completion of the Bonneville tariff process, applicable board approvals, the filing and acceptance of service agreements and tariff changes with FERC, and completion and filing of a readiness criteria certification in accordance with the ISO tariff.	February 2022-March 2022

BPA-2020-00784-F 0008

5.0 Remaining Policy Decisions Planned for Phase III

As explained in section II, Bonneville will hold stakeholder meetings, as well as pre-rate and pre-Tariff proceeding workshops on the remaining important policy issues that are not being covered in this Proposal and the ROD. These issues include:

a. Transmission Usage – Network
b. Allocation of EIM Charge Codes
c. Resource Sufficiency – Sub-Balancing Authority Area Level
d. Transmission Losses
e. Non-federal Resource Participation Requirements
f. Settlements/Billing (Mechanics)
g. Data Submission Requirements
h. Metering Requirements

This section briefly describes the policy issues that Bonneville plans to address during Phase III.

5.1 Transmission Usage Network

Bonneville's Proposal

Bonneville proposed to utilize the Interchange Rights Holder methodology to make transmission available for EIM Transfers—transfers between EIM balancing authority areas. That decision does not address what, if any, provisions are necessary regarding transmission internal to Bonneville's own EIM balancing authority area.

Bonneville plans to address the subject of transmission within the EIM balancing authority area during Phase III. That process may include provisions for Participating Resources and for loads. Bonneville will likely have a similar high-level rubric for this subject as it did for EIM Transfers—striking a balance between the efficient operation of the market with ensuring cost recovery. Bonneville will also discuss with stakeholders the mechanics of managing internal transmission consistent with EIM operations.

BPA-2020-00784-F 0008

Issue 5.1.1

Whether Bonneville should address what changes, if any, are necessary to provide transmission service inside its own balancing authority area in Phase III.

Commenters' Positions

Snohomish "appreciates that Bonneville will address transmission usage within the Bonneville Balancing Authority Area during Phase III. Snohomish also suggests additional discussion on how network curtailments will occur" and how ATC would be calculated.[487]

NRU and AWEA agree that more work is necessary and that this issue should be addressed in Phase III.[488] AWEA also states that Bonneville should strive for consistency with other EIM Entities to reduce seams issues and unintended consequences. [489]

Evaluation of Positions

Bonneville appreciates commenters' support for including this issue in Phase III. Bonneville agrees that there is work to be done on this issue, including what, if any, changes Bonneville should make to how it offers transmission service in its balancing authority area. Discussion of this issue in Phase III may result in Bonneville proposing changes to its OATT and business practices as part of Phase IV. Although Bonneville understands AWEA's concerns regarding seams issues and unintended consequences, Bonneville will retain its discretion to make decisions regarding the EIM as it pertains to the FCRTS and the operation of its balancing authority. Nonetheless Bonneville will consider the impact of seams issues with other EIM Entities in Phase III and beyond.

Decision

Bonneville will address in Phase III what changes, if any, are necessary regarding transmission service inside its own balancing authority area.

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[487] Snohomish Comments at 3.
[488] NRU Comments at 5; AWEA Comments at 1.
[489] AWEA Comments at 1.

BPA-2020-00784-F 0008

5.2 Allocation of EIM Charge Codes

Bonneville's Proposal

If Bonneville joins the EIM as an EIM Entity, Bonneville will be responsible for receiving, verifying, and paying bills, comprised of multiple charge codes, generated by the CAISO settlement system. A charge code refers to a specific settlement calculation identified in the CAISO's Business Practice Manual.[490] There are around 44 active charge codes that the CAISO could settle with Bonneville in the EIM.[491]

CAISO settlement invoices are aggregated at the balancing authority area level, and not broken down by individual Bonneville customer. Nonetheless, Bonneville must pay the CAISO, and then use its own rates to recover these costs from its Tariff customers. As such, Bonneville will need to decide whether and how it will allocate the CAISO's settlement charge codes to its transmission customers. Note that Participating Resources are billed by and settle charges directly with the CAISO.

The Phase III process is expected to result in a cost allocation design which will be included in the BP-22 and TC-22 proceedings, as appropriate.

Issue 5.2.1

Whether Bonneville should consider how to allocate EIM costs and benefits as part of Phase III.

Commenters' Positions

AWEC recommends that Bonneville immediately start considering how to account for the financial benefits of the EIM, including the potential for increased secondary sales revenues.[492] AWEC believes such issues may be best handled in a pre-rate case IPR workshop.[493] AWEC also states that co-generators are concerned with how the EIM will impact imbalance charges, noting that such charges have been volatile in the EIM but that overall costs have remained the same.[494]

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[490] *See* CAISO Tariff, Appendix A, *available at* http://www.caiso.com/Documents/AppendixA-MasterDefinitionSupplement-asof-Apr1-2019.pdf.
[491] *See* ISO Market Charge Code Matrix, *available at* http://www.caiso.com/market/Pages/Settlements/Default.aspx.
[492] AWEC Comments at 2.
[493] *Id.*
[494] *Id.* at 3-4.

BPA-2020-00784-F 0008

Seattle encourages Bonneville to develop a timeline for Phase III discussions on allocating EIM charge codes among customers.[495] Seattle believes such discussions "will likely involve competing interests and robust stakeholder discussions and will require adequate time to work through," and encourages Bonneville to incorporate cost causation principles into its proposals.[496]

AWEA states that Phase III "will be critically important to ensuring that EIM benefits are maximized and costs and benefits are properly allocated among customers," and that Bonneville should strive for consistency with other EIM Entities.[497]

NWEC notes that Phase III will result in Bonneville proposing changes to its rates and OATT in the BP-22 and TC-22 proceedings, and urges Bonneville to give these efforts the highest priority and work toward common and beneficial solutions for a number of complex issues.[498]

PNGC requests information about cost allocation well in advance of the BP-22 process.[499]

M-S-R requests that Bonneville provide a preliminary indication of how it intends to address cost and benefit allocation decisions among customer groups.[500] M-S-R believes it is necessary to have a high level understanding of the criteria Bonneville intends to use in making its initial allocation proposal(s).[501]

WPUDA requests that Bonneville "clarify how it intends to allocate revenues and costs among its power and transmission business lines, and among different classes of customers."[502]

PPC understands that Bonneville intends to use Aurora analysis to include estimated dispatch benefits from EIM participation in the BP-22 rate proceeding. PPC is interested in knowing if Bonneville intends to use different assumptions for calculating the dispatch benefits in the BP-22 rate proceeding as compared to the benefits included in the E3 study.[503]

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[495] Seattle Comments at 4.
[496] *Id.*
[497] AWEA Comments at 1.
[498] NWEC Comments at 4.
[499] PNGC Comments at 2.
[500] M-S-R Comments at 2-3.
[501] *Id.*
[502] WPUDA Comments at 4.
[503] PPC Comments at 6.

BPA-2020-00784-F 0008

PPC also suggests that in the Phase III stakeholder process, Bonneville should address how it would estimate and evaluate benefits of EIM participation for both transmission and power once it has joined the EIM. PPC recommends that Bonneville consider developing its own methodology to estimate and evaluate such benefits.[504]

Evaluation of Positions

During Phase III, Bonneville will discuss how to allocate EIM costs and benefits, including how to allocate costs and benefits between its power and transmission rates and among different classes of customers. These discussions will inform Bonneville's initial proposal for the BP-22 rate proceeding. Although Bonneville understands AWEA's desire for Bonneville's cost allocation to mirror those of other EIM Entities, Bonneville will retain its discretion to make decisions regarding the EIM. Nonetheless, Bonneville agrees with AWEA that it "will be critically important to ensuring that EIM benefits are maximized and costs and benefits are properly allocated among customers."[505]

In response to Seattle's, M-S-R's, WPUDA's, and PNGC's comments, Bonneville will provide information about allocating EIM charge codes well in advance of the BP-22 proceeding, and will develop a schedule for Phase III discussions to ensure there is adequate time to cover all Phase III issues. In determining how to allocate costs among its customers, Bonneville agrees with Seattle that Bonneville should consider cost causation, but cost causation will not necessarily be the only determinative factor in making these allocations. Bonneville also agrees with NWEC that Bonneville should give these efforts the highest priority and work toward common and beneficial solutions to a number of complex issues. Bonneville is committed to sharing its proposals and allocation criteria, and giving customers adequate time to provide input.

In response to PPC's comments, Bonneville will discuss whether and how it could include estimated dispatch benefits from EIM participation in the BP-22 rate proceeding. As part of Phase III, Bonneville will also discuss whether to estimate and evaluate benefits of EIM participation for both transmission and power once it has joined the EIM.

Bonneville disagrees with AWEC's suggestion that allocating financial benefits of the EIM should be addressed in a pre-rate case Integrated Program Review Process (IPR). IPR focuses on establishing Bonneville's spending levels.[506] It does not allocate those costs to customers, nor does it allocate benefits. These issues are better handled during Phase III,

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[504] PPC Comments at 7.
[505] AWEA Comments at 1.
[506] *See, e.g.,* 2018 Integrated Program Review, *available at*: https://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/Pages/IPR-2018.aspx.

where Bonneville will develop the EIM components of its rate proposal, and in Phase IV, where Bonneville will conduct the BP-22 rate proceeding.

Decision

During Phase III, Bonneville will develop its proposal to allocate EIM costs and benefits for the BP-22 rate proceeding.

5.3 Resource Sufficiency – Sub Balancing Authority Area level

Bonneville's Proposal

As discussed above,[507] Bonneville's balancing authority area will be evaluated as a whole for Resource Sufficiency on an hourly basis, with the results impacting its market participation. Though the balancing authority area will be evaluated in aggregate, there are multiple resources and Load Serving Entities (LSE) that can influence the outcome of those evaluations. Bonneville will consider developing policies to ensure it passes Resource Sufficiency evaluations as often as feasible.

These requirements may influence and/or be memorialized in the BP-22 and TC-22 cases.

Issue 5.3.1

Whether Bonneville should address Resource Sufficiency at the sub-balancing authority area level as part of Phase III.

Commenters' Position

Renewable Northwest states that Bonneville "determines the level of balancing reserves that it needs for VER integration in its rate cases every two years," but that "[j]oining the EIM would require Bonneville to examine, prior to each operating hour, whether it has sufficient resources to pass the EIM's resource sufficiency and flexibility evaluations."[508] This may allow Bonneville "to determine the necessary level of balancing reserves more dynamically, leading to a more efficient operation of the system that would likely increase Bonneville's ability to sell additional surplus energy and capacity products."[509]

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[507] *See* section 3.5.7.
[508] Renewable Northwest Comments at 2-3.
[509] *Id.*

BPA-2020-00784-F 0008

AWEC states that co-generators are concerned about the impact of the EIM, and any new EIM requirements.[510] AWEC wants Bonneville to actively engage with co-generators to allow plenty of lead time for any changes, so that co-generators can plan their budgets accordingly.[511]

Evaluation of Positions

In response to Renewable Northwest, Bonneville will address how it determines the level of balancing reserves in Phase III.

Bonneville understands AWEC's concerns and will work with AWEC, co-generators, and any other interested stakeholders to address Resource Sufficiency as part of Phase III. These discussions may result in Bonneville proposing changes to its OATT, business practices, and rates as part of Phase IV.

Decision

Bonneville will address Resource Sufficiency on the sub-balancing authority area level as part of Phase III.

5.4 Transmission Losses

Bonneville's Proposal

As energy is physically delivered across a transmission system there is a natural degradation, or "loss," that occurs due to physical factors such as distance and the overall loading of transmission facilities. Transmission losses represent additional physical generation that is necessary to make up the difference between a scheduled amount of energy and what is "lost." Bonneville currently requires transmission customers to either designate to return transmission losses in kind (*e.g.*, with a physical delivery of energy) 168 hours (one week) later or settle them financially.

The EIM automatically dispatches incremental losses (above base schedules, which include losses) as part of its optimized dispatch. The EIM also creates a real-time marginal price for those losses at the time of their delivery. Bonneville will discuss with stakeholders the extent to which the EIM's handling of losses should lead to changes in Bonneville's current practices regarding transmission losses, or what new opportunities are available for a

[510] AWEC Comments at 3-4.
[511] *Id.*

BPA-2020-00784-F 0008

more efficient repayment of losses. This may include the potential for moving to a practice in which losses are only settled financially instead of a physical repayment. Decisions in this process will likely influence and/or be memorialized in the BP-22 and TC-22 cases.

Issue 5.4.1

Whether Bonneville should address transmission losses as part of Phase III.

Commenters' Positions

Tacoma states that its Slice power contract allows for the provision of physical transmission losses.[512] Tacoma also states that "[a]ny new loss provision policy must be accommodating to this obligation and reasonably manageable from an operational perspective."[513]

PPC states that Bonneville has already begun discussing changes to transmission losses for TC-22, and it is not clear how that effort relates to Phase III.[514] Bonneville should clarify how the two discussions are related and identify impacts that a decision in one process will have on the other.[515]

Evaluation of Positions

In regard to Tacoma's concern, Bonneville agrees that the Slice customers' ability to physically return losses should be discussed as part of Phase III and the TC-22 and BP-22 proceedings.[516]

In response to PPC, Bonneville clarifies that there is only one process to address transmission losses, and Bonneville will continue discussions on this issue during Phase III as explained above. At the conclusion of Phase III, Bonneville may propose changes to its OATT, business practices, and rates as part of Phase IV.

Decision

Bonneville will address transmission losses as part of Phase III.

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[512] Tacoma Comments at 1.
[513] *Id.*
[514] PPC Comments at 9.
[515] *Id.*
[516] *See also* section 3.2.6.1.

BPA-2020-00784-F 0008

5.5 Non-federal Resource Participation Requirements

Bonneville's Proposal

As discussed above, Bonneville plans to utilize the "Big-10" FCRPS projects—aggregated into three separate resources—as its own Participating Resources. Bonneville will also need to develop requirements to provide the owners/operators of non-federal resources within the Bonneville balancing authority area the opportunity to act as Participating Resources.

These requirements may cover topics such as technical requirements, timing, and impacts on RS evaluations. Decisions in this process will likely influence and/or be memorialized in the BP-22 and TC-22 cases.

Issue 5.5.1

Whether Bonneville should address EIM non-federal resource participation requirements in the EIM as part of Phase III.

Commenters' Positions

NWEC encourages Bonneville to consider how demand side resources (including energy efficiency, demand response, distributed generation, storage, and other elements) can support increasing the flexibility of Bonneville's operations, and at some point bid directly into the EIM as aggregated resources. They believe "Bonneville and the Northwest should be in the forefront of expanding the EIM concept to include a balance of both generation and demand side resources."[517]

AWEC states that co-generators are concerned about the impact of the EIM and any new EIM requirements.[518] AWEC wants Bonneville to actively engage with co-generators to allow plenty of lead time for any changes, and so that co-generators can plan their budgets accordingly.[519]

AWEA states Bonneville should generally "seek to encourage non-federal EIM resource participation, as such participation will provide benefits to all load within the EIM," and

[517] NWEC Comments at 4.
[518] AWEC Comments at 3-4.
[519] *Id.*

BPA-2020-00784-F 0008

that Bonneville should seek consistency with other EIM Entities regarding EIM participation requirements, including how EIM costs and benefits are allocated.[520]

EWEB states that it supports Bonneville developing non-federal resource participation requirements as part of Phase III.[521] "EWEB believes that it is impossible to overstate the importance of working collaboratively to develop these requirements in a proactive manner."[522]

Evaluation of Positions

In response to EWEB and AWEC, Bonneville will work collaboratively with its customers to develop requirements that all resources must meet to participate in the EIM. Bonneville intends to allow as much lead time as practicable for resources to meet these requirements. As a result of these Phase III discussions, Bonneville may propose changes to its OATT, business practices, and rates as part of Phase IV.

NWEC asks Bonneville to consider whether and how demand side resources can support increasing the flexibility of Bonneville's operations. This is outside the scope of Phase III, and is a larger issue than simply whether Bonneville joins the EIM. The narrower issue of how such resources could participate in the EIM is within the scope of Phase III and may be pursued if such resources are interested in bidding into the EIM. Bonneville notes, however, that allowing energy efficiency, demand response, and other "demand-side resources" to bid into the EIM may require changes to the EIM as a whole, and that Bonneville may not be able to implement such changes through its process.

In response to AWEA's comment, Bonneville will develop requirements for EIM participation regardless of whether the resource is federal or non-federal. This is consistent with how other EIM Entities have developed resource requirements for EIM participation. Although Bonneville understands AWEA's concerns that Bonneville's EIM participation requirements mirror those of other EIM Entities, Bonneville, as stated above, will retain its discretion to make decisions regarding the EIM.

Decision

Bonneville will address EIM participation requirements as part of Phase III.

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[520] AWEA Comments at 1.
[521] EWEB Comments at 2.
[522] *Id.*

BPA-2020-00784-F 0008

5.6 Settlements/Billing (Mechanics)

Bonneville's Proposal

As discussed above in section 5.2, if Bonneville joins the EIM as an EIM Entity, Bonneville will need to decide whether and how to allocate the CAISO's charges and credits to Bonneville's transmission customers. If Bonneville decides to allocate some or all of the EIM charges and credits to its customers, Bonneville will need to decide how to bill its customers.

The CAISO's billing process is very different from Bonneville's current billing processes. Bonneville bills its customers monthly; the CAISO bills its customers weekly. The timeline for disputes under Bonneville's agreements is relatively flexible. Disputes of a CAISO bill must be received within 22 business days after receiving a settlement recalculation statement or the dispute is deemed waived. Bonneville does not routinely revise a final monthly bill and, if it occurs, does so for a particular situation; the CAISO performs multiple recalculations of an invoice before finally closing out the settlement statement 36 months after the fact.

The billing and settlement mechanics policy process in Phase III will be closely linked with the policy process on allocation of EIM charge codes.

Issue 5.6.1

Whether Bonneville should address the mechanics of settlement and billing as part of Phase III.

Commenters' Position

AWEC states that co-generators are concerned about the impact of the EIM, and any new EIM requirements. AWEC wants Bonneville to actively engage with co-generators to allow plenty of lead time for any changes, so that co-generators can plan their budgets accordingly.[523]

PNGC states that load serving entities in EIM participating balancing authorities should receive the same "settlement and billing determinant data available to EIM participants and Scheduling Coordinators."[524]

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[523] AWEC Comments at 3-4.
[524] PNGC Comments at 2.

BPA-2020-00784-F 0008

Evaluation of Positions

As part of deciding how to allocate EIM charges and credits, Bonneville must decide if it should directly allocate EIM charges and credits to its transmission customers. In making this decision, Bonneville agrees with AWEC that it must take into account the impact of directly allocating EIM charges and credits to co-generators and other transmission customers. Bonneville will discuss these issues as part of Phase III. As a result of these discussions, Bonneville may propose changes to its OATT, business practices, and rates as part of Phase IV.

Bonneville understands PNGC's desire to see the same "settlement and billing determinant data available to EIM participants and Scheduling Coordinators."[525] Bonneville, as an EIM Entity and transmission provider, will have access to an individual customer's data that may influence how other transmission customers are charged or credited under the EIM. Bonneville may not be able to make this sort of confidential information available to all transmission customers, but it will strive to be as transparent as possible in providing data to its transmission customers. Bonneville will discuss data availability in Phase III.

Decision

Bonneville will address the mechanics of settlement and billing as part of Phase III.

5.7 Data Submission Requirements

Bonneville's Proposal

Efficient functioning of the EIM is dependent on it having timely and accurate information. As such, Bonneville will need to provide a significant quantity of data regarding its EIM balancing authority area, including load and generation information from Bonneville's customers. Much of this data exists in various formats today, but Bonneville must ensure it has reliable and timely access for the EIM to function properly.

Bonneville's process will include discussions with its customers regarding the content, delivery, and timing of data needed for Bonneville to operate an EIM balancing authority area. This data, along with its timing and delivery, will include the submission of base schedules, outages, and meter data.

[525] *Id.*

BPA-2020-00784-F 0008

Issue 5.7.1

Whether Bonneville should address data submission requirements as part of Phase III.

Commenters' Position

AWEC requests early identification and communication about any potential equipment changes or upgrades that will be needed for their customers after Bonneville joins the EIM.[526]

Seattle encourages Bonneville to develop a timeline for developing data submission requirements to ensure that there is adequate time to review these topics.[527] Seattle also states that Bonneville must give customers adequate time to implement these requirements once they are determined, and that implementing these requirements "may involve a fair amount of lead time for some customers."[528]

Evaluation of Positions

Bonneville will develop a timeline for Phase III to ensure there is adequate time to address and review data submission requirements with customers and other interested stakeholders. Bonneville agrees with Seattle and AWEC that implementing these requirements may require a fair amount of lead time for customers. Bonneville will strive to communicate with customers and stakeholders in a timely manner to minimize any problems. These discussions may result in Bonneville proposing changes to its OATT, business practices, or rates as part of Phase IV.

Decision

Bonneville will address data submission requirements as part of Phase III.

5.8 Metering Requirements

Bonneville's Proposal

Physical meter data for generators and interchange is critical for accurate EIM settlements. The CAISO provides guidance and minimum standards for the submission of meter data for the EIM Entity and Participating Resource Scheduling Coordinator, but Bonneville must

[526] AWEC Comments at 3-4.
[527] Seattle Comments at 4.
[528] *Id.*

BPA-2020-00784-F 0008

develop metering requirements for the balancing authority area and submit them in a settlement quality meter data plan. This plan will be applicable to all parties in the balancing authority area, not just Bonneville. Discussions on this issue will include the quality and granularity of data as well as the submission of the data.

Issue 5.8.1

Whether Bonneville should address metering requirements as part of Phase III.

Commenters' Position

AWEC requests early identification and communication about any potential metering changes or upgrades that will be needed for their customers after Bonneville joins the EIM.[529]

Seattle encourages Bonneville to develop a timeline for developing metering requirements to ensure that there is adequate time to review these topics. Seattle also states that Bonneville must give customers adequate time to implement these requirements once they are determined, and that implementing these requirements "may involve a fair amount of lead time for some customers."[530]

Evaluation of Positions

Bonneville will develop a timeline for Phase III to ensure there is adequate time to address and review metering requirements with customers and other interested stakeholders. Bonneville agrees with Seattle and AWEC that implementing these requirements may require a fair amount of lead time for customers. Bonneville will strive to communicate with customers and stakeholders in a timely manner to minimize any problems. These discussions may result in Bonneville proposing changes to its OATT, business practices, or rates as part of Phase IV.

Decision

Bonneville will address metering requirements as part of Phase III.

[529] AWEC Comments at 3-4.
[530] Seattle Comments at 4.

BPA-2020-00784-F 0008

5.9 Other Stakeholder Proposed Topics for Phase III

In addition to the policies identified by Bonneville above, some stakeholders proposed additional policy topics to be included in phase III.

Issue 5.9.1

Whether Bonneville should include the additional policy topics proposed by stakeholders in phase III.

Commenters' Positions

The Slice Group also suggests adding some additional topics to Phase III, including the following:

- Impact of EIM imports and exports on Bonneville's Fuel Mix
- Impacts to Bonneville's power and transmission products and services
- Principles, processes, decision-making framework, and criteria for participation in evolving or emerging markets.[531]

Evaluation of Positions

The Slice Group's first proposed topic, the impact of EIM imports and exports on Bonneville's fuel mix, is discussed in section 3.5.4. In that section, Bonneville explains how it intends to approach this issue and why it will not include it as part of Phase III. Bonneville will continue to monitor carbon development policies in California and the Northwest, and will coordinate with stakeholders on this issue.

A topic regarding impacts of joining the EIM on Bonneville's products and services is a principle discussed in section 3.1. This topic will be addressed in the development of cost allocation principles, rate design, and tariff terms and conditions. It is unnecessary to create a separate topic in Phase III for this issue.

Likewise, it is unnecessary to create a separate topic addressing principles, processes, and decision-making framework as proposed. The topics set forth in this section 5 are intended to be substantive in nature. Section 2 of this ROD addresses in substantial detail Bonneville's decision-making process. Moreover, section 3.1 addresses Bonneville's principles.

[531] Slice Group Comments at 8.

BPA-2020-00784-F 0008

Sections 1.3 and 1.4 address Bonneville's consideration of the evolution of other markets, particularly EDAM and DAME, which Bonneville is closely monitoring. An additional topic regarding market evolution is not necessary at this time. In regard to a decision to sign an EIM Implementation Agreement, EDAM and DAME are beyond the scope of that decision.

Decision

Bonneville will not adopt the additional topics proposed by the Slice Group for Phase III.

BPA-2020-00784-F 0008

6.0 Miscellaneous Issues

M-S-R and PGE raised issues that Bonneville did not make a proposal on or take a position on in its Proposal.

Issue 6.1

Whether the EIM is inconsistent with the bilateral market.

Commenters' Positions

M-S-R states that "the purpose of a security-constrained [EIM] dispatch is to optimally use the transmission system," whereas the bilateral market does not necessarily result in the most efficient way to dispatch resources.[532] M-S-R states that having these two models run side-by-side could lead to inconsistencies and complexity.[533]

Evaluation of Positions

Bonneville does not believe that the EIM is inconsistent with the bilateral market. As explained in section 3.5.2, a customer may choose to donate its transmission service to the EIM. The EIM uses this transmission service (and generation voluntarily offered by customers into the market) to redispatch generation in the most cost effective manner possible, while taking into consideration transmission constraints and operating limits. This is known as security constrained economic dispatch. Likewise, customers can also choose to use their transmission service to participate in the bilateral market (*i.e.*, buy and sell generation among themselves or serve load). EIM Entities submit base schedules to the CAISO to account for these bilateral transactions. Neither the EIM nor the bilateral market preclude customers from deciding how to best use their generation and transmission service.

Although Bonneville acknowledges that it will have to revise its OATT and rate schedules to participate in the EIM, there is nothing inherently inconsistent with how the EIM operates and transmission customers' ability to continue to participate in the bilateral market. Both the EIM and the bilateral market are subject to transmission constraints and operating limits, and customers ultimately decide whether their transmission service is best used in the bilateral market or in the EIM.

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[532] M-S-R Comments at 3.
[533] *Id.*

BPA-2020-00784-F 0008

Bonneville has considerable experience in this area. Both the EIM and the bilateral market have co-existed on the FCRTS since the EIM's inception. Bonneville held two extensive public processes to evaluate its customers' use of the FCRTS for EIM participation: for PacifiCorp in 2013 and for Puget Sound Energy in 2015. In those processes Bonneville evaluated the potential use of OATT transmission for EIM dispatches and outlined the necessary controls to ensure successful coexistence of both models. Bonneville has also executed the Coordinated Transmission Agreement (CTA) with the CAISO, which established controls to ensure the reliable operation of the EIM on the FCRTS consistent with Bonneville's other contractual and OATT obligations. The CTA has been and will remain an important tool to achieve those ends.

Finally, M-S-R is incorrect that "under current BPA policy an EIM participant using BPA's transmission must have firm transmission rights."[534] Although a customer may donate Bonneville transmission service to facilitate EIM Transfers, the EIM is not limited to using this transmission service to only dispatch that particular customer's generation. Rather the EIM is free to use the donated transmission service to dispatch any generation that is voluntarily offered, subject to transmission constraints. During Phase III, Bonneville will discuss whether customers should be able to donate non-firm transmission service for EIM Transfers as discussed above. Bonneville will also have Phase III discussions regarding what changes, if any, it should make to how it provides transmission service within Bonneville's balancing authority area.

Decision

The EIM is not inconsistent with the bilateral market, and Bonneville has already taken actions to ensure that the EIM and the bilateral market can successfully co-exist on the FCRTS.

Issue 6.2

Whether the EIM should be part of Bonneville's efforts to manage intra-hour transmission congestion.

Commenters' Positions

PGE states that "the EIM should be one prong in a multipronged effort in the Northwest to address congestion and system reliability needs."[535] PGE is hopeful that this sort of multipronged effort will help alleviate constraints on the South of Allston flowgate.[536]

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[534] *Id.*
[535] PGE Comments at 1.
[536] *Id.*

BPA-2020-00784-F 0008

Evaluation of Positions

Bonneville agrees with PGE that the EIM is a useful tool for managing congestion on South of Allston and other flowgates. In fact, the EIM is already a tool that Bonneville uses to manage congestion under the terms of the CTA. Bonneville also agrees that a multi-pronged approach is needed for congestion management, and will continue to work with PGE and other stakeholders on these efforts.

Decision

The EIM is a useful tool to manage congestion, and is part of a multi-pronged approach to congestion management.

Issue 6.3

Whether the CTA will remain in effect if Bonneville joins the EIM.

Commenters' Positions

If Bonneville joins the EIM, PGE "would like to know what becomes of the CTA and the coordinating committee and working group established in the agreement."[537] PGE also expects more transparency in how Bonneville determines constraints under the CTA.[538]

Evaluation of Positions

Bonneville plans on retaining the CTA even as an EIM Entity. That being said, Bonneville is open to potential revisions where appropriate to recognize its status as an EIM Entity. Bonneville would also expect to discuss any such changes in the engagement processes laid out in the CTA, including those with regional EIM Entities.

PGE states that after Bonneville joins the EIM, it "will be able to have better visibility to utilize real time information when imposing constraints leading to more efficient use of transmission across BPA's flowgates."[539] Although Bonneville generally agrees with this statement, Bonneville notes that joining the EIM does not obviate the need to establish and enforce transmission constraints under the CTA.

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[537] *Id.*
[538] *Id.*
[539] *Id.*

BPA-2020-00784-F 0008

Regarding the level of transparency that Bonneville provides in establishing these constraints, including the Rate of Change (ROC) constraint, Bonneville will follow all appropriate rules, as they apply to EIM Entities and under the CTA, for establishing transmission constraints. Bonneville already shares study results for the ROC constraint and works with EIM Entities (including PGE) to establish study methods and inputs. Bonneville is also open to discussions about further changes to the ROC and other CTA constraints in the CTA Working Group.

Decision

Bonneville expects to retain the CTA, although it may be revised to reflect Bonneville joining the EIM. Any such revisions will be carried out in accordance with the terms of the CTA.

7.0 Conclusion

Bonneville greatly appreciates the stakeholder engagement in Bonneville's EIM decision-process thus far and the thoughtful comments submitted. Bonneville has considered all of the comments received and has reached the decisions set forth in this ROD. Bonneville will sign the Implementation Agreement and will move forward with implementation steps toward joining the EIM. Bonneville looks forward to future stakeholder engagement in Phases III, IV and V.

Issued at Portland, Oregon, this 26th day of September, 2019.

/s/ Elliot E. Mainzer

Elliot E. Mainzer
Administrator and Chief Executive Officer

BPA-2020-00784-F 0008

Attachment A

Implementation Agreement

Contract No. 19TX-16794

ENERGY IMBALANCE MARKET IMPLEMENTATION AGREEMENT

This IMPLEMENTATION AGREEMENT (Agreement) is entered into as of _____, ___, 2019 by and between the UNITED STATES OF AMERICA, Department of Energy, acting by and through the BONNEVILLE POWER ADMINISTRATION (Bonneville), and the CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION, a California nonprofit public benefit corporation ("ISO"). Bonneville and the ISO are sometimes referred to in the Agreement individually as a "Party" and, collectively, as the "Parties.

RECITALS

WHEREAS, Bonneville is a federal power marketing administration that markets electric power from multiple generating resources, including but not limited to the Federal Columbia River Power System owned and operated by the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation, and the Columbia Generating Station owned and operated by Energy Northwest;

WHEREAS, Bonneville also owns and/or operates a high voltage transmission system in the Pacific Northwest (the Federal Columbia River Transmission System) and a balancing authority area;

WHEREAS, Bonneville has determined there is an opportunity to secure benefits for Bonneville's customers through improved dispatch and operation of the Federal Columbia River Power System and through the efficient use and continued reliable operation of existing and future transmission facilities and desires to participate in the energy imbalance market operated by the ISO ("EIM");

WHEREAS, the ISO has determined there are benefits to ISO market participants through greater access to energy imbalance resources in real-time and through the efficient use and reliable operation of the transmission facilities and markets operated by the ISO, and desires to expand operation of the EIM to include Bonneville;

WHEREAS, Bonneville acknowledges that the rules and procedures governing the EIM are set forth in the provisions of the ISO tariff as filed with the Federal Energy Regulatory Commission ("FERC") and that participation in the EIM requires corresponding revisions to Bonneville's rate schedules and Open Access Transmission Tariff ("Bonneville Tariff");

WHEREAS, Bonneville's decision to participate voluntarily in the EIM is within Bonneville's sole discretion, and Bonneville will only participate in the EIM so long as such participation is on a voluntary basis and on terms and conditions acceptable to Bonneville, including Bonneville's unilateral right to terminate this Agreement as set forth below;

WHEREAS, Bonneville's EIM implementation and participation is limited to the scope of the EIM at the time this Agreement becomes effective pursuant to Section 1 below. Bonneville is under no obligation to participate in any expanded EIM markets (*e.g.*, day-ahead); and

WHEREAS, the Parties are entering into this Agreement to set forth the terms upon which the ISO will timely configure its systems to incorporate Bonneville into the EIM ("Project") on or before March 1, 2022 ("Implementation Date").

NOW THEREFORE, in consideration of the mutual covenants contained herein, and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

AGREEMENT

1. Effective Date, Term, and Bonneville's Non-Jurisdictional Status

(a) This Agreement shall become effective upon the date the Agreement is accepted, approved or otherwise permitted to take effect by FERC, without condition or modification unsatisfactory to either Party ("Effective Date").

(b) In the event FERC requires any modification to the Agreement or imposes any other condition upon its acceptance or approval of the Agreement, each Party shall have ten (10) business days to notify the other Party that any such modification or condition is unacceptable to that Party. If no Party provides such notice, then the Agreement, as modified or conditioned by FERC, shall take effect as of the date determined under Section 1(a). If either Party provides such notice to the other Party, the Parties shall take any one or more of the following actions: (i) meet and confer and agree to accept any modifications or conditions imposed by such FERC order; (ii) jointly seek further administrative or legal remedies with respect to such FERC order, including a request for rehearing or clarification; or (iii) enter into negotiations with respect to accommodation of such FERC order, provided however, if the Parties have not agreed to such an accommodation within thirty (30) calendar days after the date on which such FERC order becomes a final and non-appealable order, such order shall be deemed an adverse order and the Parties shall have no further rights and obligations under the Agreement.

(c) The term of the Agreement ("Term") shall commence on the Effective Date and shall terminate upon the earliest to occur of (1) the date all necessary revisions to the Bonneville Tariff, Bonneville's rate schedules, and the ISO tariff necessary for the commencement of Bonneville's participation in the EIM have taken effect (when the market becomes financially binding on transactions within Bonneville's balancing authority area); (2) termination in accordance with Section 2 of this Agreement; or (3) such other date as mutually agreed to by the Parties ("Termination Date").

(d) This Agreement shall automatically terminate on the Termination Date and shall have no further force or effect, provided that the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as provided therein.

(e) The ISO acknowledges that Bonneville is a non-jurisdictional utility described in section 201(f) of the Federal Power Act, 16 U.S.C. 824(f), and respects Bonneville's interest in remaining so. Nothing in this Agreement or subsequent EIM-related agreements is intended to create additional FERC jurisdiction for Bonneville, nor shall it be construed in a manner that creates additional FERC jurisdiction for Bonneville.

2. Termination

(a) The Parties may mutually agree to terminate this Agreement in writing at any time. In addition, either Party may terminate this Agreement in its sole discretion after conclusion of the negotiation period in Section 2(b) or as provided in Section 2(d) or 2(e) as applicable.

(b) If either the ISO or Bonneville seeks to unilaterally terminate this Agreement, it must first notify the other Party in writing of its intent to do so ("Notice of Intent to Terminate") and engage in thirty (30) calendar days of good faith negotiations in an effort to resolve its concerns. If the Parties successfully resolve the concerns of the Party issuing the Notice of Intent to Terminate, the Party that issued such notice shall notify the other Party in writing of the withdrawal of such Notice ("Notice of Resolution").

(c) At the time the Notice of Intent to Terminate is provided, or any time thereafter unless a Notice of Resolution is issued, Bonneville may provide written notice directing the ISO to suspend performance on any or all work on the Project for a specified period of time ("Notice to Suspend Work"). Upon receipt of a Notice to Suspend Work, the ISO shall: (1) discontinue work on the Project; (2) place no further orders with subcontractors related to the Project; (3) take commercially reasonable actions to suspend all orders and subcontracts; (4) protect and maintain the work on the Project; and (5) otherwise mitigate Bonneville's costs and liabilities for the areas of work suspended. The ISO will not invoice Bonneville pursuant to Section 4(c) of this Agreement for any milestone payment following the issuance of a Notice to Suspend Work. To the extent a Notice of Resolution is issued pursuant to Section 2(b), the Notice to Suspend Work in effect at the time shall be deemed withdrawn and the ISO shall be entitled to invoice Bonneville for any milestone completed as specified in Section 4(c) of this Agreement and Bonneville shall pay such invoice pursuant to Section 4.

(d) Any time after thirty (30) calendar days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a Notice of Resolution, the ISO may terminate this Agreement by providing written notice to Bonneville that it is terminating this Agreement

("Termination Notice") effective immediately. The ISO may terminate this Agreement under the terms of this Section 2(d) at its sole discretion for any reason.

Any time after thirty (30) calendar days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a Notice of Resolution, Bonneville may terminate this Agreement by providing written notice to the ISO that it is terminating this Agreement ("Termination Notice") effective immediately. Bonneville may terminate this Agreement under the terms of this Section 2(e) at its sole discretion for any reason.

(e) In the event this Agreement is terminated by either or both of the Parties pursuant to its terms, this Agreement will become wholly void and of no further force and effect, without further action by either Party, and the liabilities and obligations of the Parties hereunder will terminate, and each Party shall be fully released and discharged from any liability or obligation under or resulting from this Agreement as of the date of the Termination Notice provided in Section 2(d) or 2(e), as applicable, notwithstanding the requirement for the ISO to submit the filing specified in Section 2(g). Notwithstanding the foregoing, the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as specified in Sections 5 and 6, and any milestone payment obligation pursuant to Section 4(c) that arose prior to the Termination Notice in accordance with Section 2(d) or 2(e) shall survive until satisfied or resolved in accordance with Section 11.

(f) The Parties acknowledge that the ISO is required to file a notice of termination with FERC.

3. Implementation Scope and Schedule

(a) The Parties shall complete the Project as described in Exhibit A, subject to modification only as described in Section 4(e) below.

(b) The Parties shall undertake the activities described in Exhibit A with the objective of completing the Project and implementing the EIM no later than the Implementation Date, including all milestones listed under Exhibit A for the Implementation Date, subject to modification only as described in Section 3(c) below.

(c) Either Party may propose a change in Exhibit A or the Implementation Date to the other Party. If a Party proposes a change in Exhibit A or the Implementation Date, the Parties shall negotiate in good faith to attempt to reach agreement on the proposal and any necessary changes in Exhibit A and any other affected provision of this Agreement, provided that any change in Exhibit A, or any change to the Implementation Date, must be mutually agreed to by the Parties. The agreement of the Parties to a change in

BPA-2020-00784-F 0008

Exhibit A, or a change to the Implementation Date, shall be memorialized in a revision to Exhibit A, which will then be binding on the Parties and shall be posted on the internet web sites of the ISO and Bonneville, without the need for execution of an amendment to this Agreement. Changes that require revision of any provision of this Agreement other than Exhibit A shall be reflected in an executed amendment to this Agreement and filed with FERC for acceptance.

(d) At least once per calendar month during the Term, the Parties' Designated Executives, or their designees, will meet telephonically or in person (at a mutually agreed to location) to discuss the status of the performance of the tasks necessary to achieve the milestones in Exhibit A and the continued appropriateness of Exhibit A to ensure that the Project can meet the Implementation Date. For purposes of this section, "Designated Executive" shall mean the individual identified in Section 8(g), or her or his designee or successor.

4. Implementation Charges, Invoicing and Milestone Payments

(a) As itemized in Section 4(c) below, Bonneville shall pay the ISO a fixed fee of $1,870,000 for costs incurred by the ISO to implement the Project ("Implementation Fee"), subject to completion of the milestones specified in Section 4(c) and subject to adjustment only as described in Section 4(b).

(b) The ISO will provide prompt written notice to Bonneville when the sum of its actual costs through the date of such notice and its projected costs to accomplish the balance of the Project exceed the Implementation Fee. The Implementation Fee shall be subject to adjustment only by mutual agreement of the Parties if the Parties agree to a change in Exhibit A, or a change to the Implementation Date, in accordance with Section 3(c) and the Parties agree that an adjustment to the Implementation Fee is warranted in light of such change.

(c) For each milestone described in Exhibit A, the ISO shall invoice Bonneville for 1/6th of the Implementation Fee as follows:

(1) $311,650 upon the Effective Date as described in Section 1 of this Agreement for Milestone 1;

(2) $311,650 upon completion of detailed Project Management Plan for Milestone 2;

(3) $311,650 upon ISO promotion of market model including the Bonneville area market data to the market simulation non-production system, and allowing Bonneville to start connectivity testing and exchange data in advance of market simulation for Milestone 3;

BPA-2020-00784-F 0008

(4) $311,650 upon the conclusion of day-in-life simulation, and start of EIM market simulation for Milestone 4;

(5) $311,700 upon the start of full 24/7 parallel operations for Milestone 5; and

(6) $311,700 upon the first production Bonneville EIM trade date for Milestone 6.

(d) Following the completion of each milestone identified in Section 4(c)(i) through (vi), the ISO will deliver to Bonneville an invoice which will show the amount due. The invoice shall contain information specified in 5 C.F.R. § 1315.9(b) and shall contain reasonable documentation supporting the completion of the milestone being invoiced. Bonneville shall pay the invoice no later than forty-five (45) calendar days after the date of receipt. Any milestone payment past due will accrue interest, per annum, calculated in accordance with 5 C.F.R. § 1315.10.

(e) If a milestone has not been completed as described in Section 4(c)(i), (ii), (iii), (iv), or (v) and in Exhibit A, as Exhibit A may have been modified in accordance with Section 3(c), the Parties shall negotiate in good faith an agreed upon change to the Project Delivery Dates (as defined in Exhibit A) consistent with Section 3(c) such that the timing of milestone payments in Section 4(c) can be adjusted to correspond to the updated Exhibit A.

(f) If Bonneville disputes any portion of any amount specified in an invoice delivered by the ISO in accordance with Section 4(c), Bonneville shall pay its total amount of the invoice when due, and identify the disputed amount and state that the disputed amount is being paid under protest. Any disputed amount shall be resolved pursuant to the provisions of Section 11. If it is determined pursuant to Section 11 that an overpayment or underpayment has been made by Bonneville or any amount on an invoice is incorrect, then (i) in the case of any overpayment, the ISO shall promptly return the amount of the overpayment (or credit the amount of the overpayment on the next invoice) to Bonneville; and (ii) in the case of an underpayment, Bonneville shall promptly pay the amount of the underpayment to the ISO. Any overpayment or underpayment shall include interest for the period from the date of overpayment, underpayment, or incorrect allocation, until such amount has been paid or credited against a future invoice calculated in the manner prescribed for calculating interest in Section 4(d).

(g) All costs necessary to implement the Project not provided for in this Agreement shall be borne separately by each Party, which in the case of the ISO will be recovered through rates as may be authorized by its regulatory authorities.

(h) All milestone payments required to be made under the terms of this Agreement shall be made to the account or accounts designated by the Party which the milestone payment is owed, by wire transfer (in immediately available funds in the lawful currency of the United States).

5. Confidentiality

(a) All written or oral information received from the other Party in connection with this Agreement (but not this Agreement after it is filed with FERC) necessary to complete the Project and marked or otherwise identified at the time of communication by such Party as containing information that Party considers commercially sensitive or confidential shall constitute "Confidential Information" subject to the terms and conditions herein.

(b) If Bonneville publicly releases Bonneville's Confidential Information in connection with a public process or a regulatory filing, or if the ISO publicly releases the ISO's Confidential Information in connection with a public process or a regulatory filing, then the information released shall no longer constitute Confidential Information; provided, however, that Confidential Information disclosed under seal (or in such other manner as to be treated confidentially) in connection with a regulatory filing shall retain its status as Confidential Information under this Agreement. In addition, Confidential Information does not include information that (i) is or becomes generally available to the public other than as a result of disclosure by either Party, its officers, directors, employees, agents, or representatives; (ii) is or becomes available to such Party on a non-confidential basis from other sources or their agents or representatives when such sources are not known by such Party to be prohibited from making the disclosure; (iii) is already known to such Party or has been independently acquired or developed by such Party without violating any of such Party's obligations under this Section 5; (iv) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, with regard to information for discussion at any stakeholder meetings or during the stakeholder process or with any regulatory authority; or (v) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, to allow for such disclosure and designation as non-confidential or public information on a case-by-case basis in accordance with Section 10 of this Agreement.

(c) The Confidential Information will be kept confidential by each Party and each Party agrees to protect the Confidential Information using the same degree of care, but no less than a reasonable degree of care, as a Party uses to protect its own confidential information of a like nature. Notwithstanding the preceding sentence, a Party may disclose the Confidential Information or portions thereof to those of such Party's officers, employees, partners, representatives, attorneys, contractors, advisors, or agents who need to know such information for the purpose of analyzing or performing an obligation

BPA-2020-00784-F 0008

related to the Project. Notwithstanding the foregoing, a Party is not authorized to disclose such Confidential Information to any officers, employees, partners, representatives, attorneys, contractors, advisors, or agents without (i) informing such officer, employee, partner, representative, attorney, contractor, advisor, or agent of the confidential nature of the Confidential Information and (ii) ensuring that such officer, employee, partner, representative, attorney, contractor, advisor, or agent is subject to confidentiality duties or obligations to the applicable Party that are no less restrictive than the terms and conditions of this Agreement. Each Party agrees to be responsible for any breach of this Section 5 by such Party or a Party's officers, employees, partners, representatives, attorneys, contractors, advisors or agents, subject to the limitations set forth in Section 6 below.

(d) In the event that a Party is required by a court of competent jurisdiction, applicable law, including, but not limited to, the Freedom of Information Act, 5 U.S.C. § 552, or regulatory authority (by rule, regulation, order, deposition, interrogatory, request for documents, data request issued by a regulatory authority, subpoena, civil investigative demand or similar request or process) to disclose any of the Confidential Information, such Party shall (to the extent legally permitted) provide the other Party with prompt written notice of such requirement so that the other Party may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Section 5. In the event that such protective order or other remedy is not obtained, the disclosing Party hereby waives compliance with the provisions hereof with respect to such Confidential Information. In such event, the Party compelled to disclose shall (i) furnish only that portion of the Confidential Information which is legally required to be furnished, and (ii) exercise reasonable efforts to obtain assurances that confidential treatment will be accorded the Confidential Information so furnished.

(e) Either Party may seek damages or other remedies permitted by applicable law if a Party breaches this Section 5, however, the Parties will first seek to resolve any dispute regarding disclosure arising under this Section 5 by mutual agreement, subject to the limitations set forth in Section 6 below.

(f) Upon written request by a Party, the other Party shall promptly return to the requesting Party or destroy all Confidential Information it received as allowed by law, including all copies of its analyses, compilations, studies or other documents prepared by or for it, that contain the Confidential Information in a manner that would allow its extraction or that would allow the identification of the requesting Party as the source of the Confidential Information or inputs to the analysis. Notwithstanding the foregoing, a Party shall not return or destroy the other Party's Confidential Information if a third party is seeking such information under section 5(d) of this Agreement, and neither Party shall be required to destroy or alter any computer archival and backup tapes or archival and backup files (collectively, "Computer Tapes"), provided that such Computer Tapes shall be kept confidential in accordance with the terms of this Agreement.

BPA-2020-00784-F 0008

(g) Nothing in this Agreement shall be deemed to restrict either Party from engaging with third parties with respect to any matter and for any reason, specifically including the EIM, provided Confidential Information is treated in accordance with this Section 5.

(h) This Section 5, Confidentiality, applies for two years (24 months) after the Termination Date or the date of any expiration or termination of this Agreement.

6. Limitation of Liability

(a) The Parties acknowledge and agree that, except as otherwise specified in Sections 4(f) and 6 (b) of this Agreement, neither Party shall be liable to the other Party for any claim, loss, cost, liability, damage or expense, including any direct damage or any special, indirect, exemplary, punitive, incidental or consequential loss or damage (including any loss of revenue, income, profits or investment opportunities or claims of third party customers), arising out of or directly or indirectly related to such other Party's decision to enter into this Agreement, such other Party's performance under this Agreement, or any other decision by such Party with respect to the Project.

(b) Claims for property damage, personal injury and death against the United States must be brought under the Federal Tort Claims Act, 28 U.S.C. 2671 et seq. Within the limitations of applicable law, the ISO shall be responsible for injuries and damages to third-parties caused by its negligence, intentional misconduct, or breach of this Agreement.

(c) The rights and obligations under this Section 6 shall survive the Termination Date and any expiration or termination of this Agreement.

7. Representation and Warranties

(a) Representations and Warranties of Bonneville. Bonneville represents and warrants to the ISO as of the Effective Date as follows:

(1) It is duly formed under federal law.

(2) It has all requisite statutory authority necessary to carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary statutory authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organic statutes; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms.

(b) Representations and Warranties of the ISO. The ISO represents and warrants to Bonneville as of the Effective Date as follows:

(1) It is duly formed, validly existing and in good standing under the laws of the jurisdiction of its formation.

(2) It has all requisite corporate power necessary to own its assets and carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary corporate power and authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized by all necessary corporate action on its part.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organizational documents; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms, except as the same may be limited by bankruptcy, insolvency, regulatory authority, or other similar laws affecting creditors' rights generally and by principles of equity regardless of whether such principles are considered in a proceeding at law or in equity.

(6) All material governmental authorizations in connection with the due execution and delivery of, and performance by it of its obligations under this Agreement, have been duly obtained or made prior to the date hereof and are in full force and effect.

8. General Provisions

(a) This Agreement, including Exhibit A and Exhibit B to this Agreement, constitutes the entire agreement between the Parties, and supersedes any prior written or oral agreements or understandings between the Parties, relating to the subject matter of this Agreement; provided, that nothing in this Agreement shall limit, repeal, or in any manner modify the existing legal rights, privileges, and duties of each of the Parties as provided by any other agreement between the Parties, or by any statute or any other law or applicable court or regulatory decision by which such Party is bound.

(b) This Agreement may not be amended except in writing hereafter signed by both of the Parties; provided, however, the Parties may mutually agree to changes in Exhibit A in accordance with Section 4(e).

(c) Any waiver by a Party to this Agreement of any provision or condition of this Agreement must be in writing signed by the Party to be bound by such waiver, shall be effective only to the extent specifically set forth in such writing and shall not limit or affect any rights with respect to any other or future circumstance.

(d) This Agreement is for the sole and exclusive benefit of the Parties and shall not create a contractual relationship with, or cause of action in favor of, any third party.

(e) Neither Party shall have the right to voluntarily assign its interest in this Agreement, including its rights, duties, and obligations hereunder, without the prior written consent of the other Party, which consent may be withheld by the other Party in its sole and absolute discretion. Any assignment made in violation of the terms of this Section 8(e) shall be null and void and shall have no force and effect.

(f) In the event that any provision of this Agreement is determined to be invalid or unenforceable for any reason, in whole or part, the remaining provisions of this Agreement shall be unaffected thereby and shall remain in full force and effect to the fullest extent permitted by law, and such invalid or unenforceable provision shall be replaced by the Parties with a provision that is valid and enforceable and that comes closest to expressing the Parties' intention with respect to such invalid or unenforceable provision.

(g) Whenever this Agreement requires or provides that (i) a notice be given by a Party to the other Party or (ii) a Party's action requires the approval or consent of the other Party, such notice, consent or approval shall be given in writing and shall be given by personal delivery, by recognized overnight courier service, email or by certified mail (return receipt requested), postage prepaid, to the recipient thereof at the address given for such Party as set forth below, or to such other address as may be designated by notice given by any Party to the other Party in accordance with the provisions of this Section 8(g):

BPA-2020-00784-F 0008

To Bonneville:
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621
Attention: Steve Kerns, Director Grid Modernization and EIM
Email: srkerns@bpa.gov
To the ISO:

California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Attention: Petar Ristanovic, Vice President, Technology
Email: PRistanovic@caiso.com

Each notice, consent or approval shall be conclusively deemed to have been given (i) on the day of the actual delivery thereof, if given by personal delivery, email sent by 5:00 p.m., or overnight delivery, or (ii) date of delivery shown on the receipt, if given by certified mail (return receipt requested). It is the responsibility of each Party to provide, in accordance with this Section, notice to the other Party of any necessary change in the contact or address information herein.

(h) This Agreement may be executed in one or more counterparts (including by facsimile or a scanned image), each of which when so executed shall be deemed to be an original, and all of which shall together constitute one and the same instrument.

(i) Nothing contained in this Agreement shall be construed as creating a corporation, company, partnership, association, joint venture or other entity with the other Party, nor shall anything contained in this Agreement be construed as creating or requiring any fiduciary relationship between the Parties. No Party shall be responsible hereunder for the acts or omissions of the other Party.

(j) The decision to execute an EIM service agreement and participate in the EIM remains within the sole discretion of Bonneville and the decision whether to continue to offer EIM services (subject to Sections 1(c) and 2) remains within the sole discretion of the ISO.

(k) Nothing in this Agreement shall preclude a Party from exercising any rights or taking any action (or having its affiliates take any action) with respect to any other project.

(l) Unless otherwise expressly provided, for purposes of this Agreement, the following rules of interpretation shall apply: (i) any reference in this Agreement to gender includes all genders, and the meaning of defined terms applies to both the singular and the plural of those terms; (ii) the insertion of headings are for convenience of reference only and do not affect, and will not

be utilized in construing or interpreting, this Agreement; (iii) all references in this Agreement to any "Section" are to the corresponding Section of this Agreement unless otherwise specified; (iv) words such as "herein," "hereinafter," "hereof," and "hereunder" refer to this Agreement (including Exhibit A to this Agreement) as a whole and not merely to a subdivision in which such words appear, unless the context otherwise requires; (v) the word "including" or any variation thereof means "including, without limitation" and does not limit any general statement that it follows to the specific or similar items or matters immediately following it; and (vi) the Parties have participated jointly in the negotiation and drafting of this Agreement and, in the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as jointly drafted by the Parties and no presumption or burden of proof favoring or disfavoring any Party will exist or arise by virtue of the authorship of any provision of this Agreement.

9. Governing Law; Venue

This Agreement shall be governed by, and construed and interpreted in accordance with, federal law. Venue for any action hereunder shall be FERC, where subject to its jurisdiction, or otherwise any federal court with jurisdiction.

10. Communication

The Parties shall develop a communication protocol for the dissemination of material information associated with the Project, which shall be approved by Bonneville and the ISO.

11. Dispute Resolution

Unless otherwise provided herein, each of the provisions of this Agreement shall be enforceable independently of any other provision of this Agreement and independent of any other claim or cause of action. In the event of any dispute arising under this Agreement, the Parties shall, to the extent practicable, first attempt to resolve the matter through direct good faith negotiation between the Parties, including a full opportunity for escalation to executive management within the Parties' respective organizations. If the Parties are unable to resolve the issue within thirty (30) calendar days after such escalation of the dispute, then for matters subject to FERC jurisdiction either Party shall have the right to file a complaint under Section 206 of the Federal Power Act. For all other matters, the Parties may pursue litigation in a federal court with jurisdiction over the Parties.

12. Third Party Agreements

The Parties may engage in discussions with third parties, either jointly or unilaterally, to facilitate the Project. Each Party may adopt or modify tariffs or enter into or modify binding agreements between such Party and third parties to implement the approved terms and conditions of the Project or EIM as necessary and appropriate.

13. Compliance

(a) Each Party shall comply with all applicable federal, state, local or municipal governmental authority; any governmental, quasi-governmental, regulatory or administrative agency, commission, body or other authority entitled to exercise any administrative, executive, judicial, legislative, policy, regulatory or taxing authority or power, including FERC, NERC, WECC; or any court or governmental tribunal, having jurisdiction over the Party in connection with the execution, delivery and performance of its obligations under this Agreement.

(b) This Agreement is not intended to modify, change or otherwise amend the Parties' current functional responsibilities associated with compliance with WECC and NERC Reliability Standards; provided, however, the Parties may enter into separate mutually agreed to arrangements to clarify roles and responsibilities associated with compliance with WECC and NERC Reliability Standards in respect of this Agreement.

14. Bonneville's EIM Implementation and Participation Principles

The Parties recognize the following principles regarding implementation of the Project and Bonneville's potential participation in the EIM.

(a) **Statutory, Regulatory, and Contractual Requirements**
Bonneville's EIM implementation and participation will be consistent with its statutory, regulatory, and contractual requirements.

(b) **Voluntary Market Participation**
Bonneville's EIM participation will include voluntary market entry and exit, voluntary bid and offer volumes and pricing, voluntarily making transmission available for EIM Transfers and the ability to voluntarily forego engaging in EIM Transfers in one or more specified operating intervals consistent with the ISO tariff and the Bonneville Tariff.

(c) **Reliability and Operation of the Federal Power and Transmission Systems**
Bonneville will continue to be responsible for the reliable operation of the Federal Columbia River Power System and the Federal Columbia River Transmission System. Notwithstanding the ISO's resource sufficiency requirements for the EIM, Bonneville will retain the exclusive right to determine what is required to maintain reliability within its balancing authority area and on its transmission system. The Parties will work in good faith during implementation to ensure that Bonneville's EIM participation will not interfere with Bonneville's existing reliability tools.

(d) **Federal Generation Participation**
Bonneville may utilize the ISO's resource aggregation models to participate in the EIM as permitted by the ISO's Business Practice Manuals. If Bonneville chooses to use an available resource aggregation model, Bonneville will identify its aggregated participating resources, aggregated non-participating resources, and other resources in the ISO's master file.

(e) **Automation Support**
In order to effectively participate in the EIM and ensure both reliable and economic outcomes, Bonneville will endeavor during implementation to automate interactions with existing EIM user interfaces based on the ISO's technical specifications. The ISO will assist Bonneville based on jointly determined requirements, feasibility and cost by 1) providing Application Programming Interfaces to interactions with existing EIM user interfaces, and 2) system or tool enhancements as jointly agreed.

(f) **Greenhouse Gas Attributes**
If Bonneville elects to allow its EIM transfers to be delivered to California, the transfers will be consistent with the Cap and Trade program administered by the California Air Resources Board, which may include Bonneville's status as an Asset Controlling Supplier.

(g) **Base Schedule Submission Timeframes**
Prior to the Implementation Date, the ISO will pursue, involving Bonneville and other stakeholders, moving the market closing timeline for financially binding hourly resource plans from T-40 to T-30. In addition, the ISO will explore with Bonneville and other stakeholders other potential enhancements to the EIM fifteen minute market timelines.

(h) **Consideration of Other EIM Enhancements**
Prior to the Implementation Date, Bonneville will propose in the appropriate ISO process(es) or forum(s), and the ISO will consider, certain EIM enhancements that:

(1) improve the accuracy of hourly resource plans;

(2) permit resource sufficiency obligation transfers, *e.g.*, bid range transfers;

(3) improve the flexible ramping sufficiency test through various mechanisms, including but not limited to incorporation of renewable generation forecasts into the flexible ramping requirement computation; and

(4) increase transparency of data required for the validation of EIM settlement statements.

IN WITNESS WHEREOF, each of the Parties has caused its duly authorized officer to execute this Implementation Agreement as of the date first above written.

CALIFORNIA INDEPENDMENT SYSTEM OPERATOR CORPORTAION		UNITED STATES OF AMERICA Department of Energy Bonneville Power Administration	
By:		By:	
Name:	Peter Ristanovic *(Print / Type)*	Name:	Janet C. Herrin *(Print / Type)*
Title:	Vice President, Technology	Title:	Chief Operating Officer
Date:		Date:	

EXHIBIT A
PROJECT SCOPE AND SCHEDULE

The Project consists of the activities and delivery dates identified in this Exhibit A, implemented in accordance with the Agreement. The Parties have included a schedule for the Implementation Date to coordinate their efforts required for completion of the Project on a milestone track.

The ISO shall invoice Bonneville for each of the milestones described below pursuant to section 4(c) of the Agreement.

The Parties understand that input received from stakeholders during the course of implementing the Project, conditions imposed or questions raised in the regulatory approval process, and the activities of the Parties in implementing the Project may cause the Parties to determine that changes in the Project are necessary or desirable. Accordingly, this Exhibit A may be modified in accordance with Section 3(c) of the Agreement.

Each Party is responsible for performing a variety of tasks necessary to achieve the milestones on the scheduled dates specified in the table below ("Timeframe") and shall plan accordingly. The Parties shall communicate and coordinate as provided in the Agreement to support the planning and execution to complete the Project.

Project Scope and Milestones	Timeframe
Milestone 1 – Effective Date Upon the Effective Date of the Implementation Agreement as described in Section 1 of this Agreement.	September 2019 – December 2019
Milestone 2—Detailed Project Management Plan The Parties will develop and initiate a project management plan that describes specific project tasks each Party must perform, delivery dates, project team members, meeting requirements, and a process for approving changes to support completion of the Project. This phase will include a detailed IT system review to assist Bonneville in development of a detailed metering plan, bidding and billing system(s), and coordination with Bonneville EMS upgrade(s). Work will be initiated on the Bonneville staff training program using the foundational and detailed system computer-based training modules, as well as on the resource data templates needed during Milestone 2.	October 2019- April 2020
Milestone 3— System Implementation and Connectivity Testing for Market Model Upon ISO promotion of market network model including the Bonneville area to the non-production system, and allowing Bonneville to connect and exchange data in advance of market simulation.	May 2020- June 2021

BPA-2020-00784-F 0008

Project Scope and Milestones	Timeframe
Milestone 4— Market Simulation Completion of day-in-life simulation, and start of market simulation scenarios.	June 2021- November 2021
Milestone 5— Start of Parallel Operations The ISO will activate a parallel operation environment to practice production grade systems integration as well as market processes and operating procedures in anticipation of the impending Bonneville activation as an EIM Entity and to confirm compliance with the EIM readiness criteria set forth in the ISO tariff. This milestone will include the following: • Staged Weekday/Weekend/Weeknight (in progressive sequence) operations with considerations of minimum support during holiday periods; and • Full 24/7 operations.	December 2021- February 2022
Milestone 6—Final preparation for System Deployment and Go Live with a target of no later than 3/2/2022 This milestone will include resource registration, operating procedures and updates, execution of service agreements, completion of the Bonneville tariff process, applicable board approvals, the filing and acceptance of service agreements and tariff changes with FERC, and completion and filing of a readiness criteria certification in accordance with the ISO tariff.	February 2022- March 2022

BPA-2020-00784-F 0008

EXHIBIT B
FEDERAL GOVERNMENT CONTRACT PROVISIONS

This Exhibit B contains federal government contract provisions that are necessary for Bonneville to enter into the Agreement.

1. Covenant Against Contingent Fees

Each of the Parties warrants to each of the other Parties that no person or selling agency has been employed or retained by it to solicit or secure the Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by any Party for the purpose of securing business. For breach or violation of this warranty by any Party other than Bonneville, Bonneville will have the right to annul the contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

2. Contract Work Hours and Safety Standards

The Agreement, to the extent that it is of a character specified in Section 103 of the Contract Work Hours and Safety Standards Act (Act), 40 U.S.C. § 3701, as amended or supplemented, is subject to the provisions of the Act, 40 U.S.C. §§ 3701-3708, as amended or supplemented, and to regulations promulgated by the Secretary of Labor pursuant to the Act.

3. Equal Opportunity Employment Practices

Section 202 of Executive Order No. 11246, 30 Fed. Reg. 12319 (1965), as amended by Executive Order No. 12086, 43 Fed. Reg. 46501 (1978), as amended or supplemented, which provides, among other things, that the Parties will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, is incorporated herein by reference the same as if the specific language had been written into the contract.

4. Use of Convict Labor

The Parties agree not to employ any person undergoing sentence of imprisonment in performing the Agreement except as provided by 18 U.S.C. § 3622(c), as amended or supplemented, and Executive Order No. 11755, 39 Fed. Reg. 779 (1973), as amended or supplemented.

Attachment B

Bonneville Power Administration
Energy Imbalance Market Benefits Study

Final Report

Attachment B

Bonneville Power Administration Energy Imbalance Market Benefits Study

Final Report

June 18, 2019



Energy+Environmental Economics

Bonneville Power Administration Energy Imbalance Market Benefits Study

Final Report

June 18, 2019

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Table of Contents

1 Overview of Benefits Study 1

2 Gross Dispatch Benefits 3

2.1 Modeling Methodology 3

2.2 Northwest Price Scenarios 5

2.3 Sensitivities 7

3 Transmission Benefits 10

4 Appendix i

4.1 Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch ii

4.2 Big 10 Hydro Spinning Capability Available for EIM Participation iii

4.3 Northwest EIM Price Statistics for 2016-2018 Historical Period iv

4.4 Sensitivity Assumptions v

4.5 Monthly Revenues by Scenario vi

4.6 Average Simulated EIM Transfers by Scenario vii

1 Overview of Benefits Study

Bonneville Power Administration (BPA) retained Energy and Environmental Economics, Inc. (E3) to study the potential economic benefits of BPA's participation in the Western Energy Imbalance Market (EIM), drawing on E3's experience performing similar benefits studies for other BAAs across the West. The goal of the benefits study was to estimate the benefit of BPA's participation in EIM using an industry standard EIM benefits modeling approach, customized to reflect the specific constraints and capabilities of BPA's system. E3 worked closely with BPA staff to define these input data and assumptions for representing BPA's system to best characterize both (1) the potential dispatch benefits under different price scenarios and subject to sensitivities in price regimes, hydro flexibility and operations as well as (2) the potential transmission benefits that BPA could realize through EIM participation.

Across the scenarios evaluated, this study found average annual gross dispatch benefits to BPA are shown in Table 1. Additional sensitivities relative to the Northwest Midpoint/Base Scenario are also shown in Table 1. We discuss the potential benefits of EIM as a complementary transmission tool for (1) transmission schedule curtailments and (2) as a platform for economically enabling non-wires solutions to moderately sized transmission constraints.

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Table 1. Gross Dispatch Benefits for Scenarios and Sensitivities

	Average Revenue ($ million)	Annual Revenue ($ million)		
Scenarios & Sensitivities		**2016**	**2017**	**2018**
PSEI Price Scenario	**36.1**	43.6	33.0	31.6
PACW Price Scenario	**40.4**	54.7	39.9	26.7
BPAT Price Scenario (Initial Scenario)	**48.9**	48.0	49.9	48.9
NW Midpoint/Base Scenario (PGE Price)	**39.2**	**49.5**	**39.9**	**28.2**
Reduced Price Volatility Sensitivity	**35.3**	44.9	36.1	24.8
California GHG Compliance Sensitivity	**34.6**	45.6	34.5	23.8
FRST-Only Participation Sensitivity	**24.4**	32.3	25.4	15.6
Higher Success Rate Sensitivity	**47.1**	59.4	47.8	34.0

2 Gross Dispatch Benefits

2.1 Modeling Methodology

E3 developed scenarios for estimating the gross EIM dispatch benefits from BPA purchasing and selling energy as an EIM participant. E3 modeled these benefits using an industry-standard price-taker PLEXOS methodology employed in E3's previous EIM benefits studies, together with actual BPA data and CAISO-reported EIM prices for calendar years 2016-2018. In these scenarios, the following conservative modeling assumptions were used to isolate the benefits of BPA operations alone:

- Historical Big 10 projects spinning capability[1, 2]
  (Combination of Big 6 projects feasible min/max output and residual Big 10 INC/DEC spin capacity, as illustrated in **Section 4.1**)
- 24-hour energy neutrality (to avoid hydraulic management issues)
- All non-Big-10 generators in BPA's BAA treated as fixed subhourly
- 75% success rate applied to calculate EIM benefits to offset PLEXOS model's perfect foresight within each dispatch day

[1] Limiting participation to historical spinning capability also reduces the amount of additional wear-and-tear due to subhourly redispatch associated with the EIM benefits estimated in this study.
[2] Historical spinning capability resulted in BPA failing the flexible ramping sufficiency test (FRST) about 15% of intervals. In these intervals, no EIM benefits are assigned; in practice, should BPA choose to join, the Big 10 Hydro would be scheduled differently to ensure that the FRST was passed the vast majority of the time.

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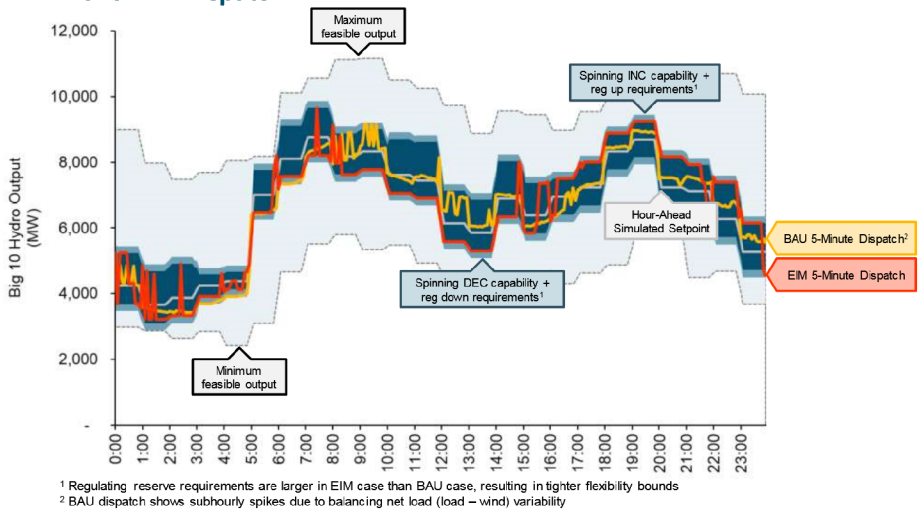
Figure 1 shows how these constraints combine to determine the flexibility available for subhourly dispatch in both the Business-As-Usual (BAU) and EIM cases. Under the BAU case, the subhourly flexibility is used to meet BPA's BAA net load variability and forecast error, while in the EIM case, the market is both a source and sink for economic flexibility. For example, when market prices are low, EIM purchases may be used instead of hydro dispatch to serve INC needs, while when prices are high hydro INC flexibility may be incremental sold into the EIM to increase revenues. Similar logic applies for DEC flexibility.

BPA-2020-00784-F 0008

Figure 1. Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch[3]



[1] Regulating reserve requirements are larger in EIM case than BAU case, resulting in tighter flexibility bounds
[2] BAU dispatch shows subhourly spikes due to balancing net load (load – wind) variability

2.2 Northwest Price Scenarios

We developed four Northwest Price Scenarios to illustrate the gross dispatch benefits of BPA's participation subject to exposure to various historical EIM prices in the region (see **Section 4.3** for summary statistics on Northwest prices). This gross dispatch benefit is calculated as the incremental net revenue (sales revenue – purchase cost) that BPA can achieve by transacting in the 15- and 5-minute EIM markets.

The Northwest Midpoint/Base Scenario used historical DGAP_PGE-APND prices from 2016 through 2018. We also assumed the same hydrological conditions, resource output, and loads within BPA's Balancing Authority Area footprint for

[3] See **Section 4.1** for enlarged version of this graphic.

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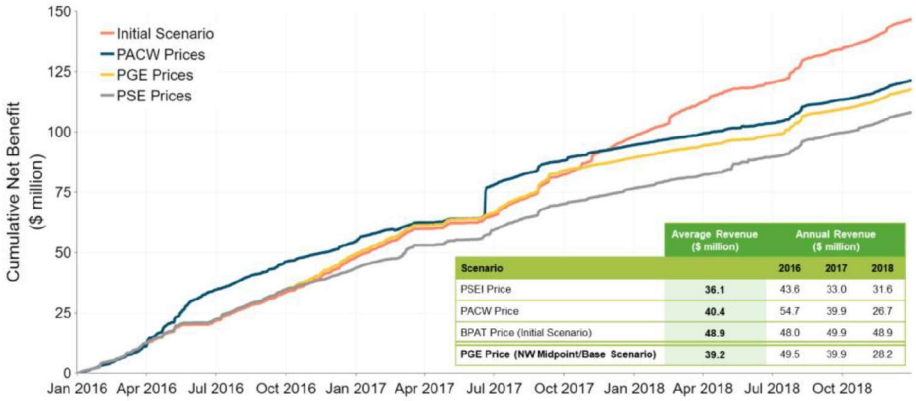
this period. This scenario showed gross dispatch benefits of **$39 million/year** on average over the 3 years due to BPA's participation in EIM during the historical years simulated. The effect of a broader range of Northwest EIM prices on gross dispatch benefits is shown below, which reflects the impact of different pricing conditions across the BAAs in the Northwest.

Figure 2. Cumulative Gross Dispatch Benefits for Northwest Price Scenarios[4]



Scenario	Average Revenue ($ million)	Annual Revenue ($ million) 2016	2017	2018
PSEI Price	**36.1**	43.6	33.0	31.6
PACW Price	**40.4**	54.7	39.9	26.7
BPAT Price (Initial Scenario)	**48.9**	48.0	49.9	48.9
PGE Price (NW Midpoint/Base Scenario)	**39.2**	49.5	39.9	28.2

Across these scenarios, we show that available hydro flexibility is a major factor in EIM value for BPA. In late spring/early summer months, where hydro flexibility is most constrained, the model shows that EIM benefits are lowest. See **Section 4.5** for monthly revenues for each scenario.

For the remainder of the study, the scenario using PGE prices (DGAP_PGE-APND) is considered as the **NW Midpoint/Base Scenario**.

[4] BPA's Northwest neighbors' price points span over times prior to these entities joining the EIM as well as after joining the EIM. PACW joined the EIM prior to the modeled historical period, PSE joined the EIM in the fall of 2016 while PGE joined the EIM in fall of 2017, which will have affected their prices and are reflected in these benefits.

BPA-2020-00784-F 0008

2.3 Sensitivities

In addition to the Northwest price scenarios, we analyzed four sensitivities based on the **NW Midpoint/Base Scenario** to independently illustrate the impact of different key assumptions. See **Section 4.3** for a qualitative discussion on these assumptions. The results of these sensitivities are shown in **Figure 1**. The sensitivities we considered were as follows:

- **Reduced Intra-Hour Price Volatility**
  In this sensitivity, we reduce intra-hour 15- and 5-minute EIM price volatility by 50% such that modeled EIM prices are 50% closer to their hourly average than observed by CAISO in the historical record for the DGAP_PGE-APND pricing node. This is meant to estimate the economic impact of a situation where subhourly volatility decreases relative to historical observations and/or the market is relatively "shallow" at extreme prices. However, this sensitivity preserves the diurnal pattern of prices. This sensitivity tends to reduce prices and the benefits.
- **California GHG Fee Compliance**
  In this sensitivity, we attempt to model the impact of BPA's inability to pay for GHG allowances associated with unspecified imports into California. To model this, we penalize the model for selling in intervals where historical EIM prices showed a nonzero marginal cost of carbon component, which is indicative of non-California entities as a whole importing GHG-containing energy into California via the EIM. This is consistent with BPA selling energy to non-California entities in the EIM and not being able to get the price premium associated with the cost of GHG compliance in California. This sensitivity tends to reduce the benefits.

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+ **FRST-Only Participation**
  In this sensitivity, we further reduce BPA's Big 10 Hydro participation in EIM to the minimum flexibility needed to pass the Flexible Resource Sufficiency Test (FRST). This limit was determined to be the most representative assumption for minimum flexibility. This sensitivity tends to reduce the benefits.

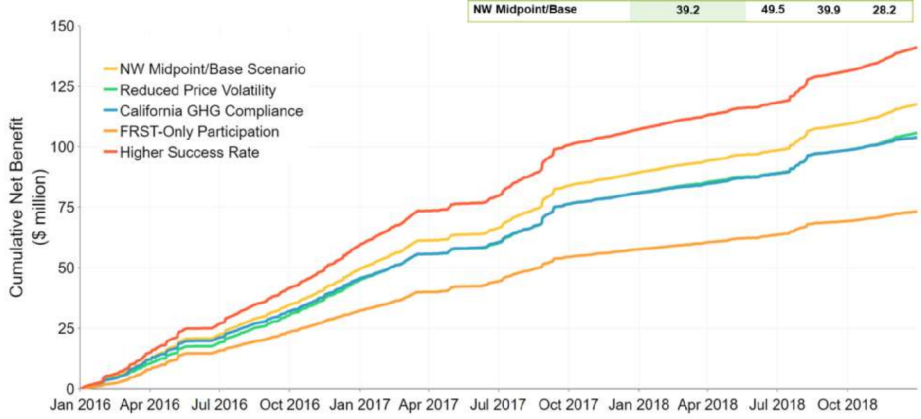
+ **Higher Success Rate**
  In this sensitivity, we assume that the success rate for BPA's participation in EIM increases from 75% to 90%. Across the other scenarios and sensitivities, we assume a success rate of 75% to derate the benefits associated with the modeled participation. This success rate may be less than 100% due to imperfect foresight during actual operations. This can encompass situations such as if BPA's bids do not successfully clear the EIM in all intervals, if there is limited market depth at a given price point (e.g., the price decreases due to BPA's marginal participation), or if there are unforeseen hydro constraints that were not captured in the historical spinning capability. This sensitivity tends to increase the benefits.

The first three sensitivities above estimated that benefits would be reduced by between **$4-15 million/year** relative to the NW Midpoint/Base Scenario, reflecting a wider range of plausible pricing and flexibility assumptions for BPA's participation. Meanwhile, increasing success rate increases benefits by the same percentage amount.

BPA-2020-00784-F 0008

Figure 3. Cumulative Gross Dispatch Benefits for Sensitivities

Scenario	Average Revenue ($ million)	Annual Revenue ($ million) 2016	2017	2018
Reduced Price Volatility	35.3	44.9	36.1	24.8
California GHG Compliance	34.6	45.6	34.5	23.8
FRST-Only Participation	24.4	32.3	25.4	15.6
Higher Success Rate	47.1	59.4	47.8	34.0
NW Midpoint/Base	**39.2**	**49.5**	**39.9**	**28.2**



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3 Transmission Benefits

Transmission investments will continue to be an important part of BPA's planning efforts; for example, transmission will be needed to connect new generators and loads as well as replace aging infrastructure. However, in certain situations EIM can provide viable benefits to BPA's transmission customers.

E3 and BPA staff defined two ways in which EIM participation could provide benefits to BPA's transmission customers. These benefits come from the EIM's **security-constrained economic dispatch** (SCED), which optimally manages congestion across the entire market footprint. In both cases, the EIM is useful for addressing short-term, moderate-sized needs and is complementary to the planning and operational tools that BPA employs today:

- Transmission Curtailment
- EIM as a Non-Wires Solution

In situations where system operating limits are at risk of being exceeded, BPA currently may choose to curtail transmission schedules to maintain reliability. Under current practice, schedules are curtailed pro-rata according to NERC Curtailment priorities, which is non-optimal, resulting in more MW of curtailed schedules that is needed to address the local constraint. In contrast, EIM's SCED is designed to incorporate all system operating limits directly into the dispatch

BPA-2020-00784-F 0008

algorithm, creating a lowest-cost dispatch across the entire market footprint that maintains operational feasibility. With the larger market, there is also a larger pool of available resources to maintain system balance, providing a more precise and effective tool for addressing moderately sized transmission constraints.

Table 2. Characteristics of Various Transmission Planning Solutions

	EIM	DR	Storage	Transmission Build
Generation Capacity Value	No	Yes	Yes	No
Energy Value	Yes	Yes	Yes	No
Transmission Capacity Value	Low	Low	Medium	High
Congestion Area	Wide	Local	Local	Local
Congestion Value	High	Medium	Medium	High
Effort to Provision	Low	Medium	Medium	High
Levelized Costs	$	$$	$$$	$$
Call Option Timing	N/A	0-2 Days	0-2 Days	N/A
Response Time	8-12 Minutes	0-18 Hours	0-18 Hours	N/A
Duration	5-240 Minutes	1-360 Minutes	1-480 Minutes	30-50 Years
Uses	Load Service Imbalance Energy Economic Dispatch Congestion Management Renewable Integration Energy Optimization	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services Energy Optimization	Load Service Renewable Integration

Table 1 describes the characteristics of various planning solutions for addressing transmission flow relief. Certain solutions provide multiple uses and value streams; for example, demand response and storage can provide generation capacity value while EIM and new transmission do not. Due to the subhourly and voluntary nature of EIM, it cannot be relied upon for hourly resource sufficiency or long-term resource adequacy needs, so investments in other resources within BPA's territory will still be necessary. Similarly, some solutions are faster responding (such as EIM being able to redispatch within minutes compared to day-ahead demand response calls), while others (such as transmission build) are able provide flow relief over multiple decades. No single

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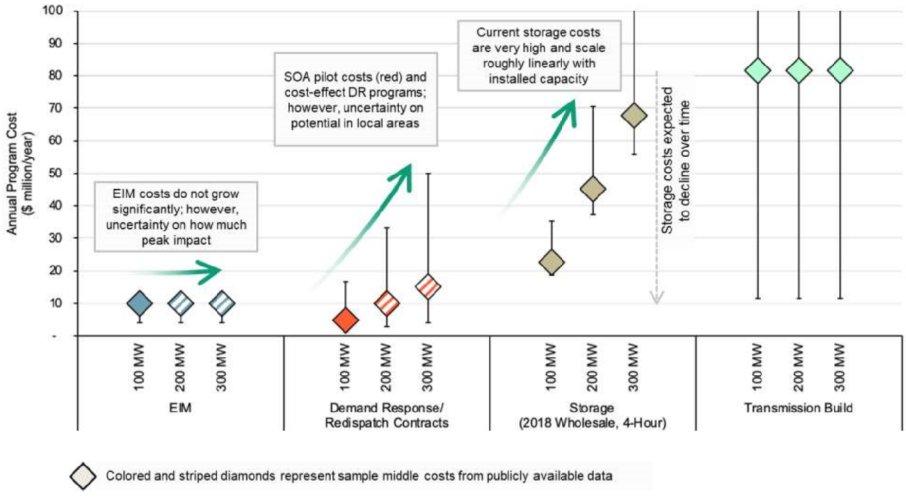
solution described above can provide all the benefits at the lowest for all transmission needs at the lowest cost; the comparison emphasizes that adding new tools to BPA's planning toolkit provides yet another economic solution that can be deployed to serve customers.

Figure 4. Gross Annual Program Cost for Various Transmission Planning Solutions at Illustrative Flow Relief Levels



Using publicly available cost information[5], **Figure 4** compares the **estimated gross annual program costs**[6] for each of the solutions discussed, scaled to illustrative flow relief levels of 100 MW, 200 MW, and 300 MW. The figure shows EIM as possibly providing more than 100 MW of flow relief (dashed

[5] EIM levelized costs come from latest BPA implementation estimates, levelized over 20 years at an 8% discount rate. Redispatch contract costs are based on the South-of-Allston pilot. Demand response cost ranges come from latest BPA DR potentials study and are based on upfront implementation costs; Bonneville expects that levelized costs of an ongoing DR program would be significantly lower than those from the time-limited SOA pilot. Storage costs come from Lazard's Levelized Cost of Storage 4.0 study; these estimates may differ from near-term costs for battery storage projects in BPA's territory. Transmission costs come from recent BPA (proposed) projects.

[6] The **net annual program costs** for various solutions may be lower when considering the other sources of value that each solution can provide. For example, demand response and storage have unique purposes outside of congestion management, such as generation capacity value, which can offset some of the gross program costs.

BPA-2020-00784-F 0008

diamonds) for almost no incremental cost; however, as the need increases, the uncertainty of whether EIM can provide that required relief increases as well. The flatness of gross EIM program costs contrasts with the localized nature of other transmission solutions, which generally scale with size and/or number of load relief areas.

Table 3. Illustrative Quantitative Example of Annual Program Costs

Batteries and Redispatch Case		EIM Case	
100 MW battery @ $226/kW-year	$22.6 million/year	$10 million/year (levelized startup and ongoing costs)	$10 million/year
100 MW Redispatch Contract / DR @ $50/kW-year[7]	+ $5.0 million/year		
Annual Cost	**= $27.6 million/year**		**= $10 million/year**

To illustrate the comparison of gross program costs, **Table 3** presents an example of two potential flowgates, each needing 100 MW of intra-hour flow relief. If we assume that EIM can provide the flow relief needed, the total levelized cost of using EIM is $10 million/year. In contrast, under a business-as-usual case, where BPA may procure a mix of batteries, demand response, and redispatch contracts, the gross program cost would be $27.6 million/year at current costs. Scaling these cases to twice the size—4 flowgates or 200 MW—would result in $55.2 million/year in cost under the example Batteries and Redispatch Case and $10 million/year in the EIM Case. Both cases provide other benefits to BPA's operations that could lower the net cost associated with

[7] The SOA Redispatch Pilot program provided approximately 100 MW of flow relief for ten 4-hour events per year, during summer weekday afternoons, from 200 MW of incremental and 200 MW of decremental capacity based on a prior pre-schedule call option requirement for manual deployment. A longer term (5-7 year) program may have been less expensive on an annual basis.

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providing flow relief; however, this simple quantitative example illustrates that the costs associated with EIM (regardless of how costs are allocated) can be lower than alternative solutions for small- to moderately-sized needs.

BPA-2020-00784-F 0008

4 Appendix

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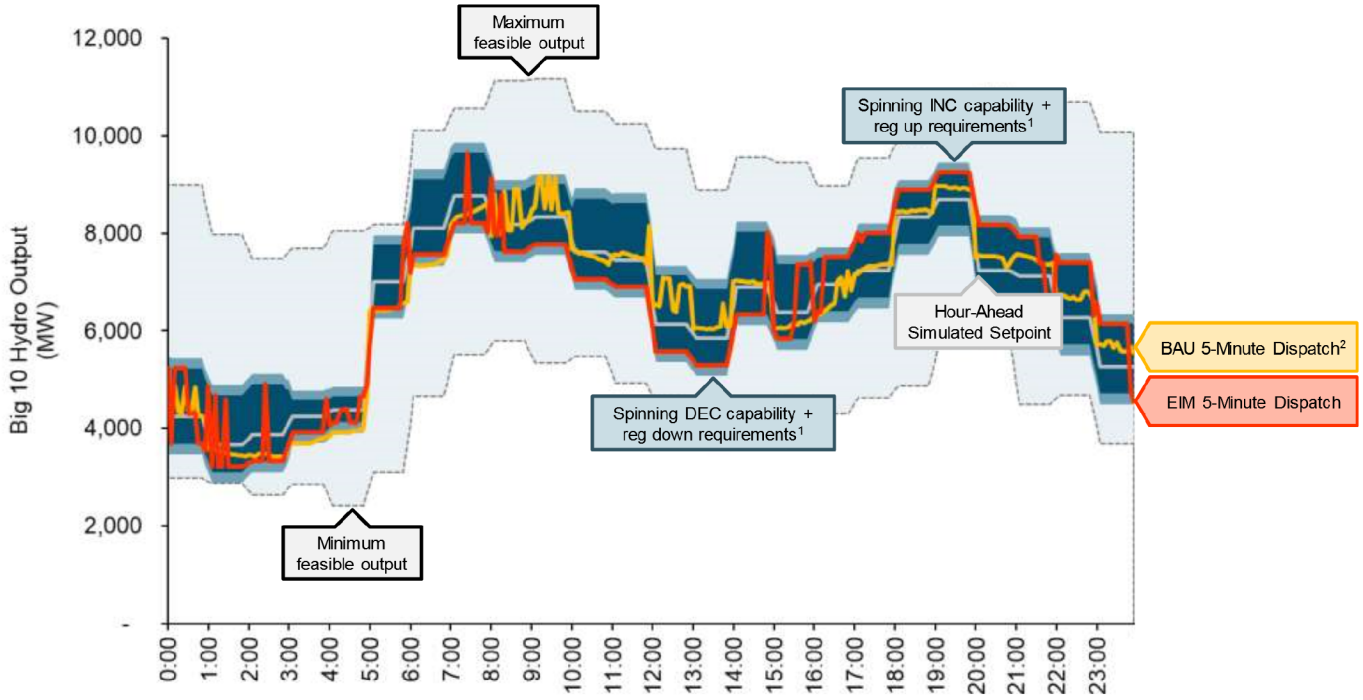
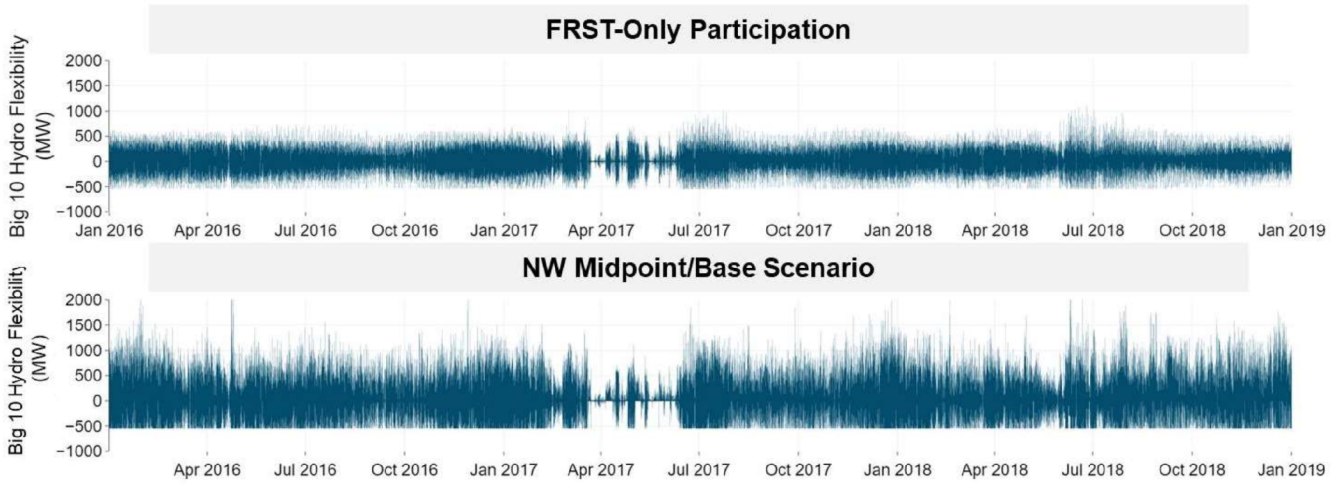
4.1 Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch



[1] Regulating reserve requirements are larger in EIM case than BAU case, resulting in tighter flexibility bounds
[2] BAU dispatch shows subhourly spikes due to balancing net load (load – wind) variability

4.2 Big 10 Hydro Spinning Capability Available for EIM Participation



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4.3 Northwest EIM Price Statistics for 2016-2018 Historical Period

	DGAP_BPAT-APND		DGAP_PACW-APND		DGAP_PGE-APND		DGAP_PSEI-APND	
EIM Market	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***
Mean ($/MWh)	29.31	28.48	24.37	21.94	26.57	25.86	24.68	23.46
Median ($/MWh)	26.01	24.24	22.66	21.56	24.64	23.22	23.58	22.44
Max ($/MWh)	1,189.40	1,112.64	1,004.51	1,184.21	1,061.71	1,256.62	1,104.54	1,477.32
Min ($/MWh)	-176.44	-371.9	-1,892.05	-1,037.59	-155.67	-374.77	-201.03	-321.19
>$100/MWh (hours)	189	272	103	103	118	197	110	139
<-$100/MWh (hours)	1	6	12	44	2	9	46	69

4.4 Sensitivity Assumptions

Sensitivity	NW Midpoint Assumption	More Optimistic	More Conservative
Success Rate	• 75%	• Higher success rate: Better foresight on hydro operations and success in being awarded bids at modeled price	• Lower success rate: Hydro is more constrained than expected or bids are not successfully awarded to BPA
Hydro Flexibility	• Actual "Big 10" Hydro INC/DEC spinning capability • Daily hydro energy balance • BPA meets FRST in all hours	• Use hydro capability beyond spinning capability on "Big 10" Hydro • Optimize FCRPS to increase available capability for EIM transactions • Allow hydro to be balanced across multiple days	• Limiting available spinning capability for EIM participation e.g. no participation beyond what is required for FRST only
EIM Price	• 2016-2018 PGE prices	• Historical DGAP_BPAT-APND prices are more volatile	• PSE prices are on average lower and less volatile • NW average prices would decrease overall price volatility
EIM Intra-Hour Price Volatility	• Actual volatility of 2016-2018 PGE prices	• Price volatility within the hour will stay the same	• Price volatility within the hour is reduced due to higher EIM participation
California GHG Fee	• No marginal cost of GHG considered in EIM prices	• n/a	• EIM prices are reduced when increasing generation during intervals of nonzero marginal cost of GHG

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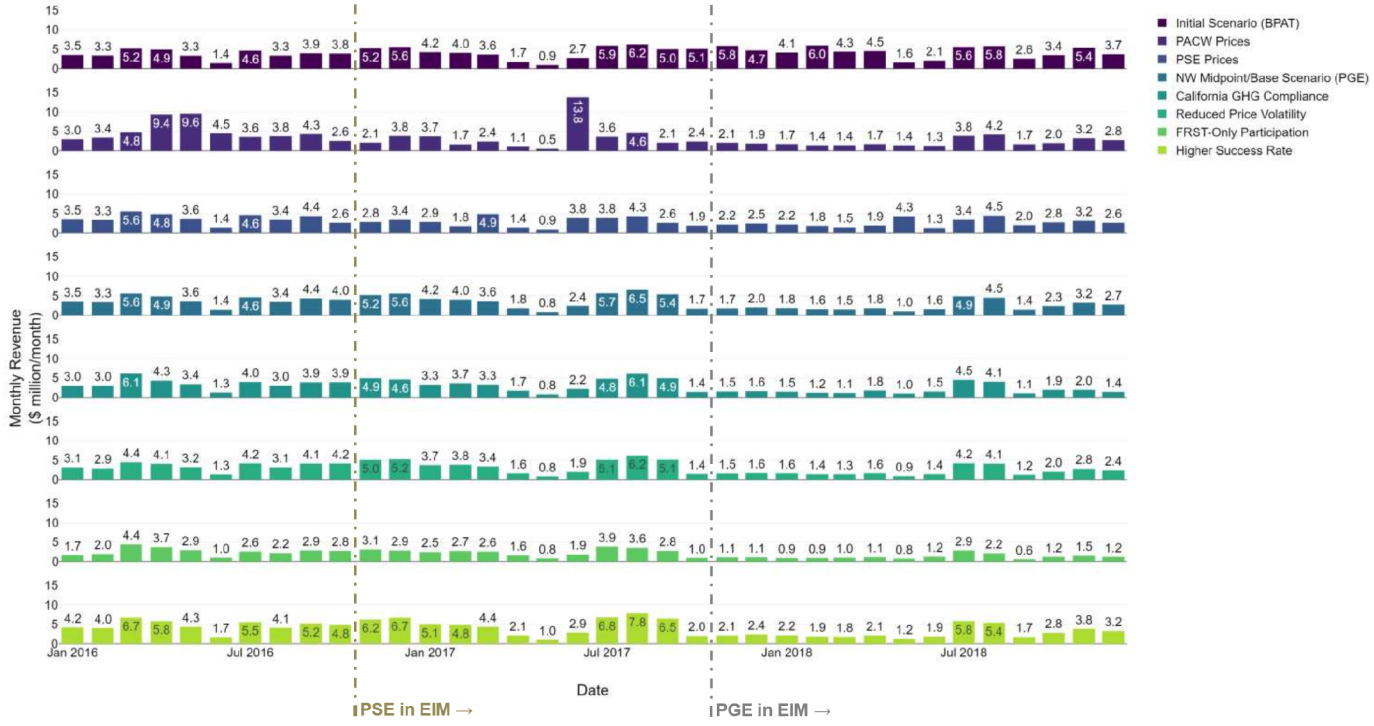
4.5 Monthly Revenues by Scenario



4.6 Average Simulated EIM Transfers by Scenario

	Sales (INC)		Purchases (DEC)	
Market	***15-Minute*** (average MW)	***5-Minute*** (average MW)	***15-Minute*** (average MW)	***5-Minute*** (average MW)
BPAT Prices (Initial Scenario)	232.2	164.6	233.7	169.9
PACW Prices	237.0	174.2	240.2	192.1
PSE Prices	230.8	164.2	233.2	168.7
NW Midpoint/Base Scenario	**231.9**	**161.4**	**232.6**	**166.0**
California GHG Compliance	202.6	132.5	203.3	137.3
Reduced Price Volatility	228.8	156.5	227.5	160.1
FRST-Only Participation	158.0	123.5	158.8	128.1
Higher Success Rate	231.9	161.4	232.6	166.0

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BONNEVILLE POWER ADMINISTRATION
DOE/BP-4938 • September 2019

From: Lauren Tenney Denison
Sent: Tue Dec 03 10:02:01 2019
To: Burczak,Sarah E (BPA) - BD-3
Subject: [EXTERNAL] RE: EIM issues for follow up from Letter to the Region
Importance: Normal

That sounds great Sarah, thanks.

Also we talked over moving the meeting Friday and unless there are scheduling conflicts that can't be resolved, we would really prefer to keep it in the morning. We sent out an announcement to our members last week and folks have been planning around that time.

Thanks,
Lauren

From: Burczak,Sarah E (BPA) - BD-3 <seburczak@bpa.gov>
Sent: Tuesday, December 3, 2019 9:37 AM
To: Lauren Tenney Denison <tenney@ppcpdx.org>
Cc: Michael Linn <mlinn@ppcpdx.org>; Irene Scruggs <iscruggs@ppcpdx.org>
Subject: RE: EIM issues for follow up from Letter to the Region

Hi Lauren –

I realized I never followed up with you about this. I believe a lot of this will fall under our implementation track which I am starting to work with Roger Bentz, our implementation lead, to come up with a stakeholder plan and rough timeline. I hope to follow up with you on this in a week or two once we sketch that out. If there are any immediate issues you think don't fall under these, please let me know and I can see if we can get answers sooner for you.

Sarah

From: Lauren Tenney Denison < tenney@ppcpdx.org>
Sent: Wednesday, November 20, 2019 1:57 PM
To: Burczak,Sarah E (BPA) - BD-3 < seburczak@bpa.gov>
Cc: Michael Linn < mlinn@ppcpdx.org>; Irene Scruggs < iscruggs@ppcpdx.org>
Subject: [EXTERNAL] EIM issues for follow up from Letter to the Region

Hi Sarah,

As we discussed this morning, here is the list of issues we asked for more discussion on in our response to the letter to the region – it looks longer than it really is, I was just trying to be complete and give some context . I am including the language from our comments in Italics to provide a little more detail behind the request. As I mentioned on the phone, I don't think there is a rush to get on these before the new year, but I wanted to make sure they stay on the list for being explored eventually. I think most of these would be better discussed in a smaller public power group given the topics, but we are open for

discussion on what the best forum would be.

1. 1. More details on how BPA will implement EIM participation to ensure it is consistent with preference and surplus requirements
- * I think NRU and WPAG made similar comments on this as well

For instance, the proposal includes a finding that "Bonneville's proposed participation in the EIM is consistent with the preference and surplus requirements of federal law." We have no reason to believe that participation in the EIM will be inconsistent with these requirements based on scoping efforts to date; however, BPA and stakeholders have not discussed specifically how the agency plans to meet its requirement to first offer surplus power to preference customers before it would offer such power to the EIM. Again, we have no reason to believe that participation in the EIM would prevent this from occurring, but more discussion is needed to understand how this will be implemented consistent with the agency's statutory obligations.

1. 2. More details on the bidding strategy to ensure it is consistent with the system sales approach
- * Again I think NRU submitted similar comments

Similarly, more exploration is needed to confirm the agency's conclusion that "bidding in capacity from specific federal hydroelectric dams or groups of federal hydroelectric dams is consistent with Bonneville's statues." PPC would appreciate more discussion on this point to better understand the mechanics behind BPA's anticipated bidding strategies which we anticipate could confirm BPA's finding quoted above. For example, does the agency plan on having separate bid curves for each of the aggregated resource groups, in general how will these bid curves be developed, and how is this approach consistent with the agency's interpretation that it must provide service on a system basis.

1. 3. Discussion on how BPA will track/assess benefits of EIM participation
- * I know this one is a tough discussion and may come up during cost allocation, but particularly on the Power side our folks will be interested in understanding how participation is impacting secondary sales. I think there is some skepticism about the estimates generated by the CAISO and folks would like to see BPA do its own analysis.

In the next phase of the stakeholder process, BPA should address how it would estimate and evaluate benefits of EIM participation for both the transmission and power sides of its business once it has joined the EIM. We understand this may be a difficult analysis and will require some collaboration between the agency and its stakeholders to develop a methodology. While existing analysis performed by others may be a helpful starting point for estimating benefits, we encourage BPA to consider developing an independent methodology. This would be more transparent, and likely more meaningful, to BPA stakeholders compared to the benefit estimates calculated by others.

1. 4. GHG Accounting and Impacts to BPA's system mix
- * Alyssa has set up a meeting to kick off scoping of this issue and we understand it fits in a larger

stakeholder process. Having a more holistic discussion on GHG and BPA's system mix will be helpful, but an overview of the current GHG rules may still be a helpful discussion at an upcoming "customer led" workshop.

More discussion is also needed on the policies and implementation of Greenhouse Gas (GHG) accounting in the EIM. It is important for BPA's preference customers to understand how this accounting will impact BPA's system mix as well as the anticipated financial benefits associated with EIM participation. The agency has stated that it will opt out of selling directly into California via the EIM until it is given the authority by Congress to directly purchase carbon allowances. BPA should also commit to completing a review of GHG accounting in the EIM prior to "opting in" to serve California load. It is imperative that BPA and its preference customers understand how GHG accounting in the EIM works to ensure that BPA's valuable, carbon-free resources will be properly compensated, and that BPA's system mix will not be unexpectedly impacted.

…

… as discussed above, we would like to work with agency staff to review how participation in the EIM would impact BPA's system mix. This review should include a walk-through of CAISO's GHG accounting rules to help customers better understand the mechanics of this accounting methodology. Use of specific examples during these discussions would be particularly helpful to understanding how transactions inside and outside of California would be treated differently. These discussions on the GHG accounting rules should also include review of recent CAISO policy changes to GHG accounting to discuss whether these changes are sufficient to address concerns that EIM participants have raised on this issue. As discussed above it is also important that BPA address how changes to the system mix resulting from participation may impact preference customer's ability to meet their obligations under state law.

There are also several topics we identified for more discussion, but for now it seems like those topics will be addressed in the course of some of the TC/BP/EIM Ph. 3 discussions. If that is not the plan it would be helpful to have some additional time to address these specific issues.

- * Ensuring participation is consistent with contractual commitments (both P and T)
    - * Seems like this will likely be addressed through some of the transmission discussion and discussions that BPA is having with Slice customers, but some additional conversation directly related to this issue may be needed

Consistency with contractual commitments is another area within the legal review that would benefit from additional discussion. We are not suggesting that BPA's participation as an EIM Entity would cause it to fail to meet its contractual commitments, but there are many details of BPA's participation which are yet to be explored. For that reason, this determination is more appropriate to include in the Phase V close out letter after BPA's participation scoping process is completed.

- * Assumption on benefits from EIM in Rate Case and how those compare to Business Case analysis

- * I think this was raised in the kick-off meeting and is on the Power Rates team's radar

PPC's understanding is that BPA plans to conduct an analysis using Aurora to include estimated dispatch benefits resulting from EIM participation in the next rate case. We look forward to more discussion around that analysis, including what, if any, assumptions will be different between the E3 study and the rate case study. Understanding the impacts to rates resulting from BPA's EIM participation is an area of significant interest for PPC and its members. This includes understanding how the benefits assumed in rates relate to the range of dispatch benefits described in the proposal.

- * Qualitative benefits to Power?
  - * Same for this issue

There may also be qualitative benefits to Power Services or its customers that may not be reflected in the dispatch benefits. We look forward to working with BPA to understand any such benefits. This would help the agency and customers have a more complete understanding of the benefits of participation, including whether there are benefits that advance the agency's strategic objectives that may not be captured in the cost benefit analysis.

- * Quantitative benefits to Transmission?
  - * Anticipating this will come up again when we get into cost allocation discussions – also possibly for RS

We appreciate the analysis BPA shared during the initial phases of the stakeholder process identifying some of the possible avoided costs for transmission service. We understand that many of the benefits associated with transmission service will be directly accrued to BPA's transmission customers, which is one reason that the transmission benefits associated with participation are difficult to quantify. We would like to continue to build on the work that has been done by BPA staff to explore potential methods for quantifying these benefits.

- * Requirements/principles for BPA to join the market?
  - * We might not get there specifically on EIM, but the EDAM principles BPA has developed and shared start to address this question.

We would also like to work with BPA to identify the aspects of the market that are necessary to enable BPA's participation in the EIM. PPC has developed a list of "Key Market Elements" that are important to ensuring BPA's initial and continued participation in the EIM is consistent with the principles we have identified. These are included in the PPC Principles for BPA's EIM Participation document attached to these comments. We would like to work with BPA staff to identify what they believe are key market elements that support the agency's participation. So far, the stakeholder discussions have largely focused on looking for "show-stoppers" which would prevent participation. We would like to understand what elements BPA sees as required to enable their participation. This discussion should include existing policies as well as potential and proposed policies under discussion in CAISO stakeholder processes.

Please let me know if you have any questions. Thanks for tracking all of this!
Lauren

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650 NE Holladay Street, Suite 810
Portland, OR 97232
503-595-9777

INTERNAL WORKING DRAFT

ENERGY IMBALANCE MARKET IMPLEMENTATION AGREEMENT

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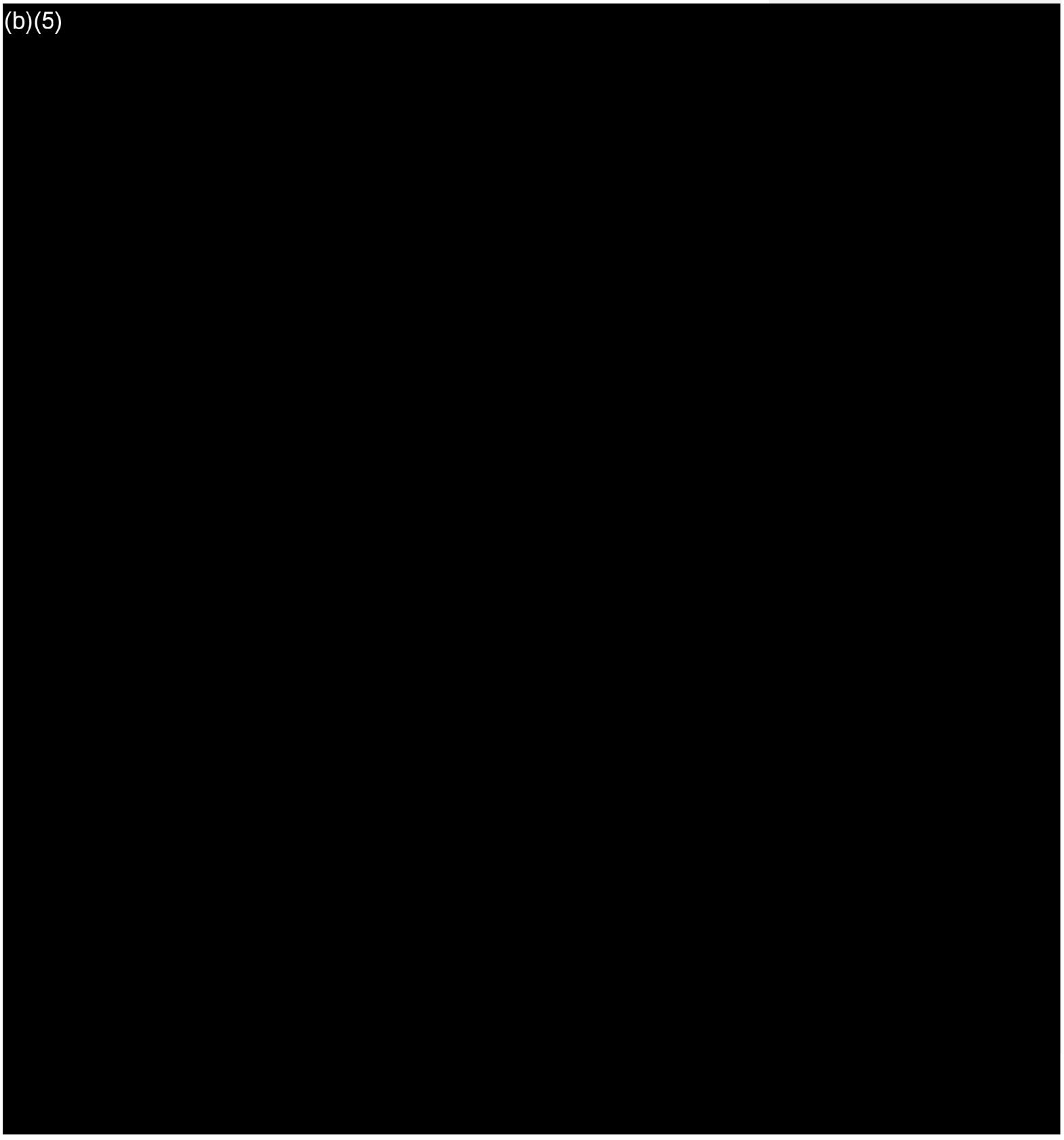

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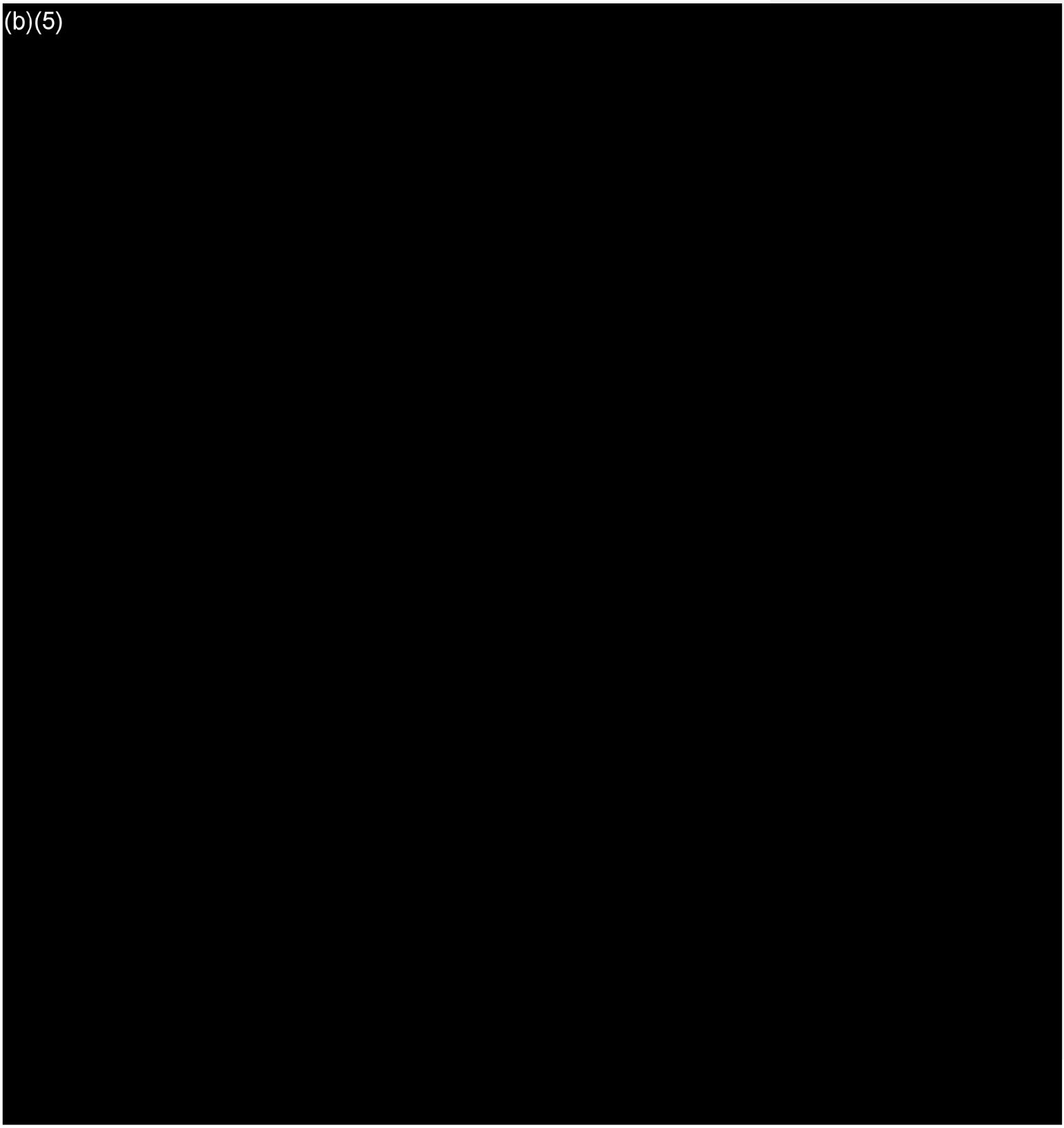

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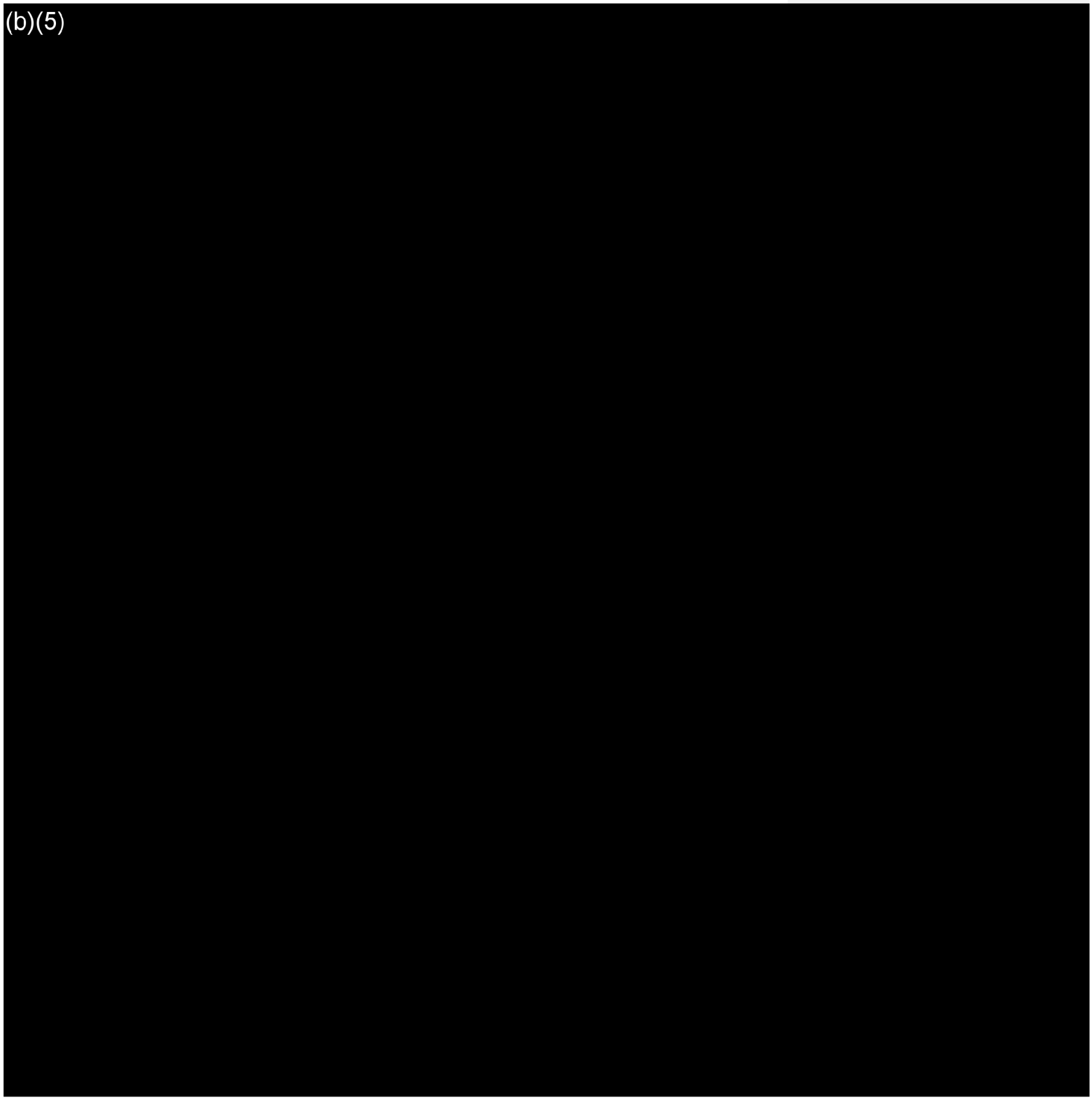

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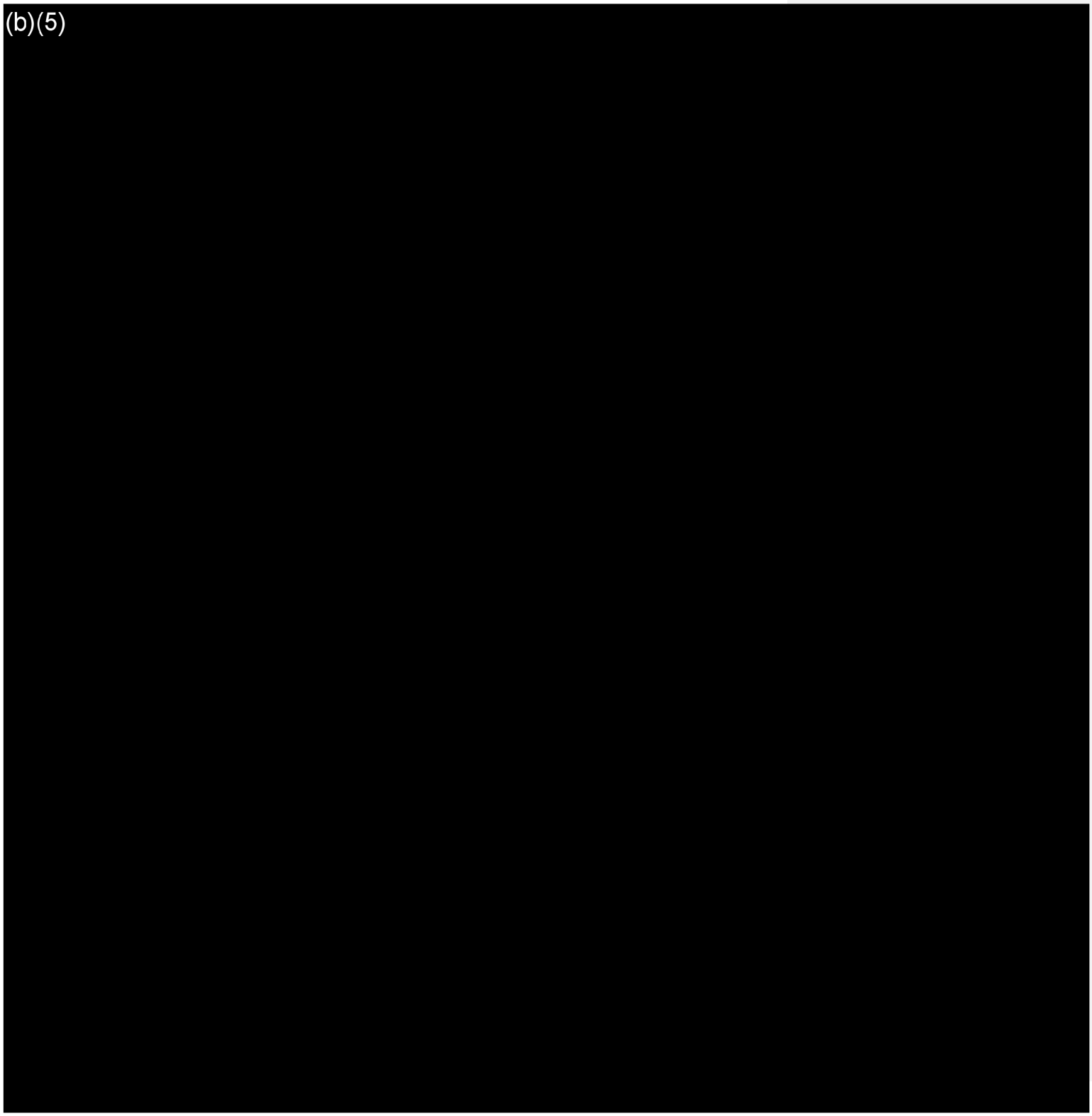

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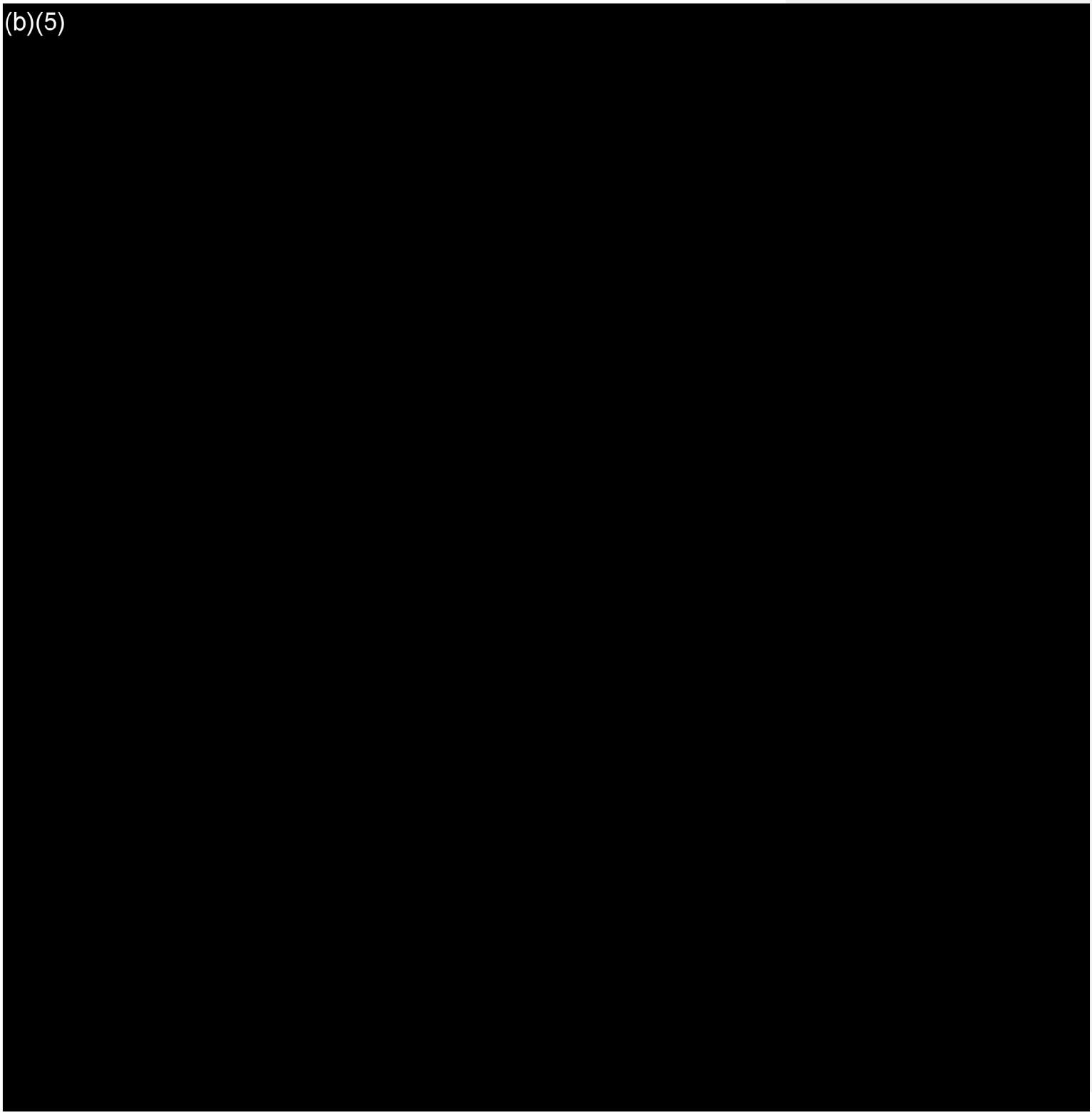

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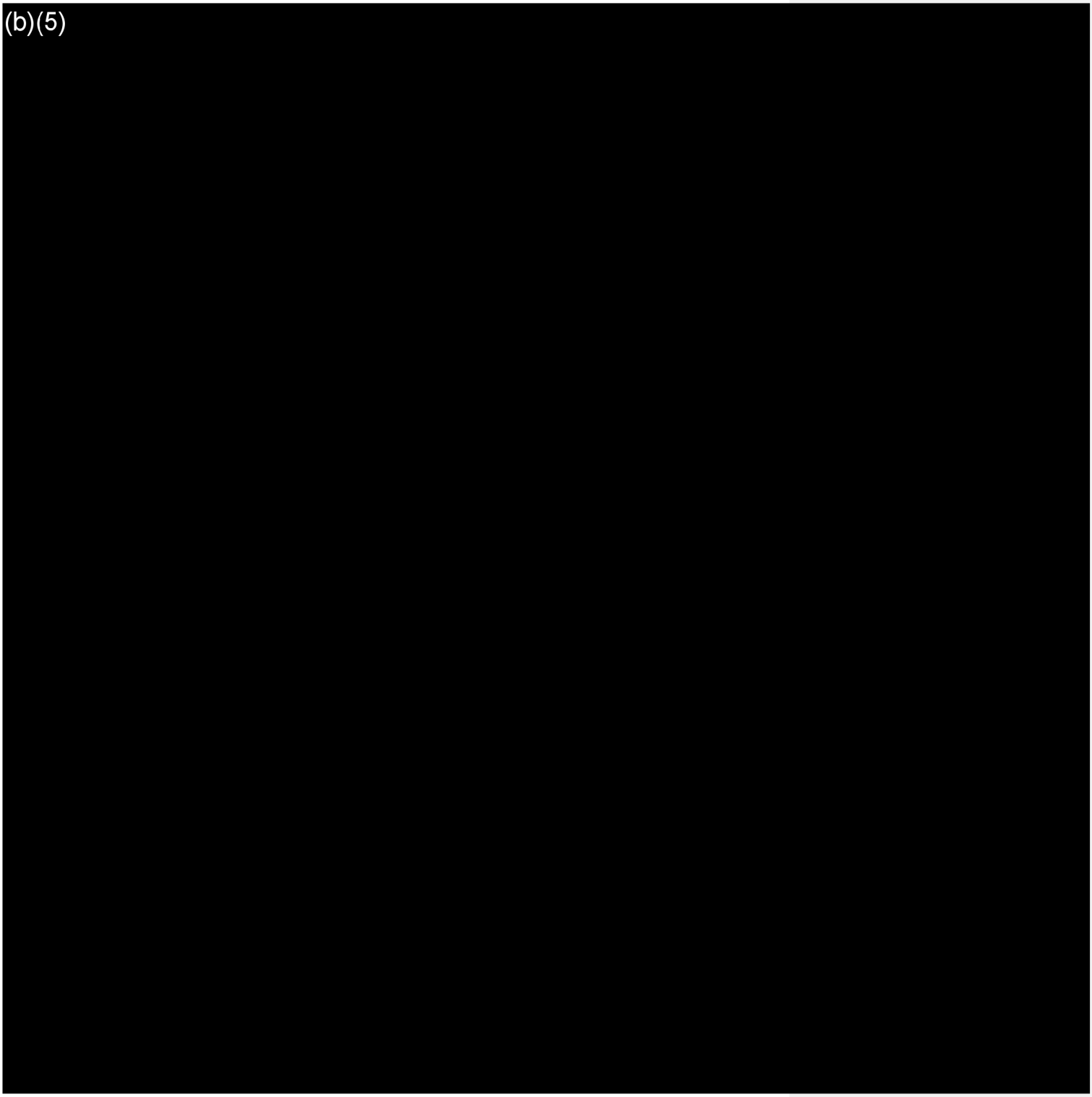

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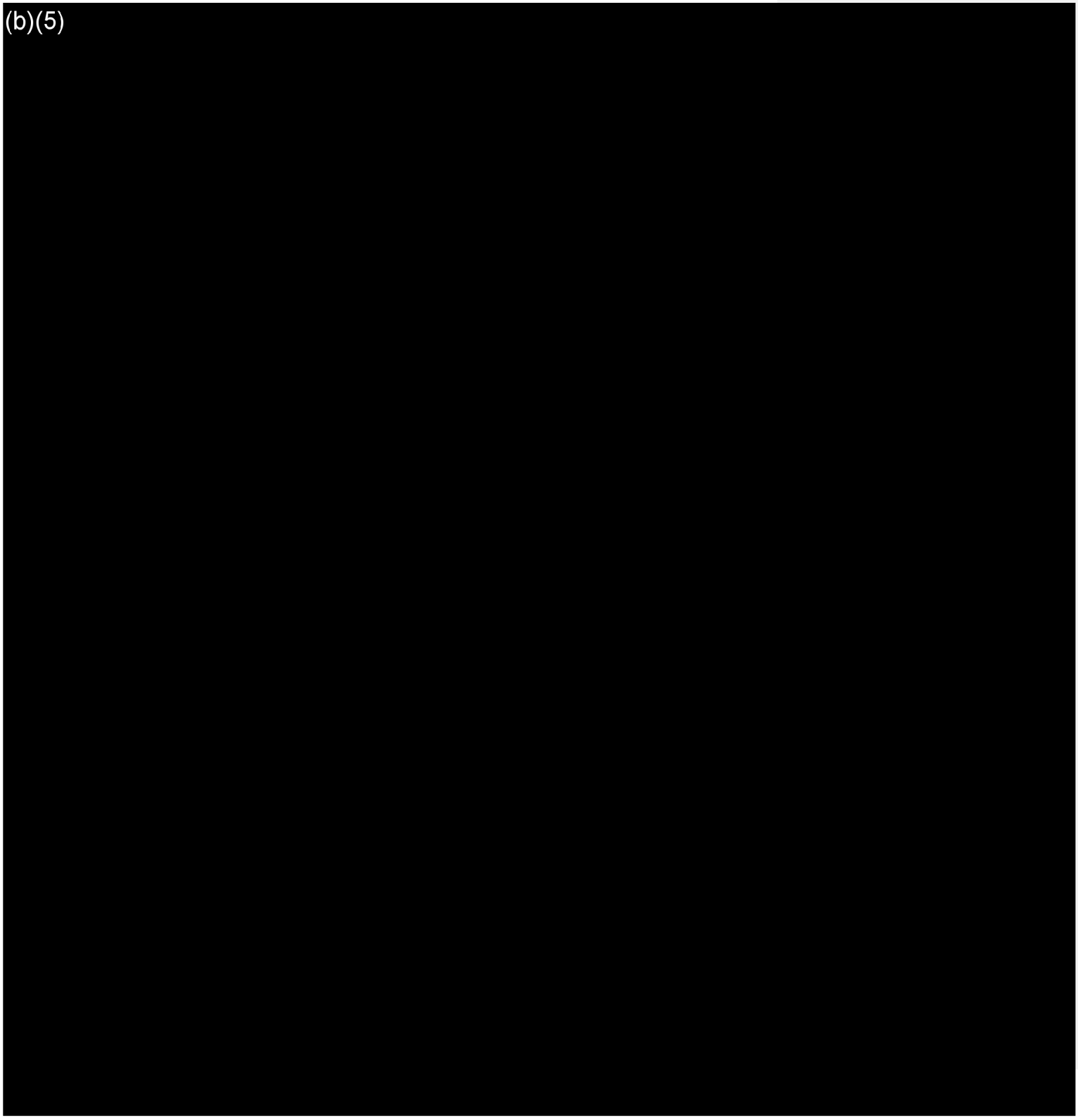

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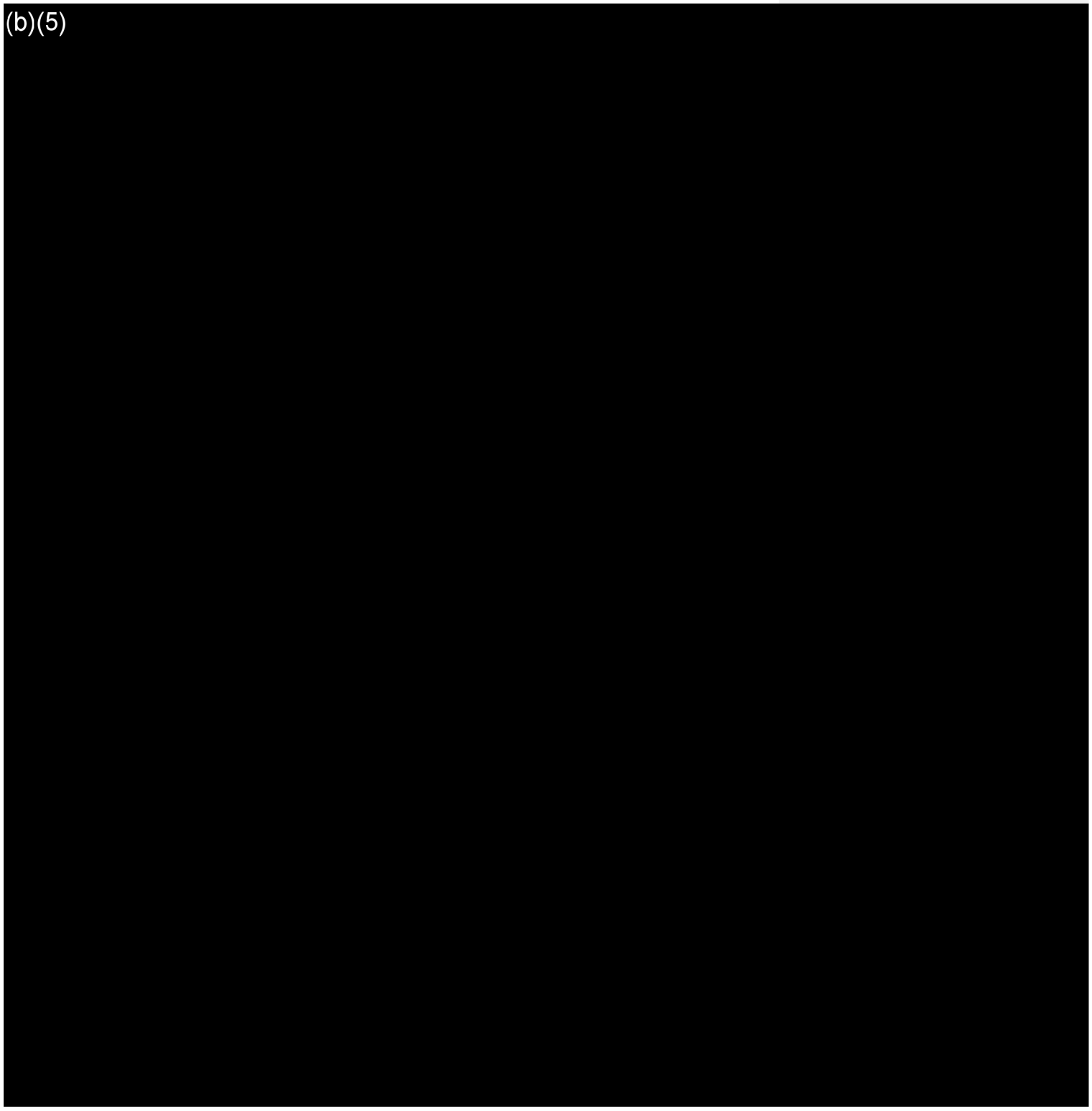

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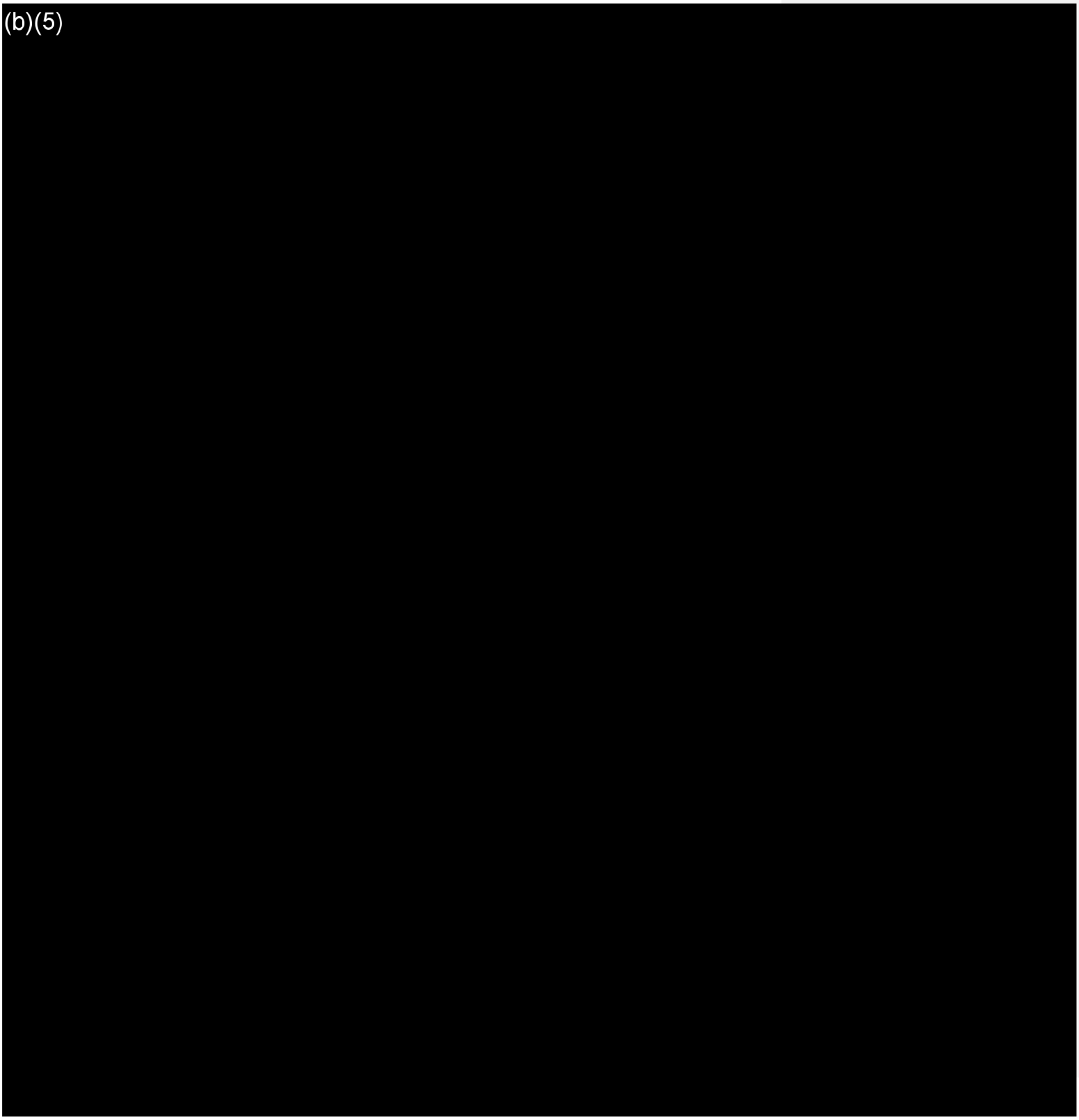

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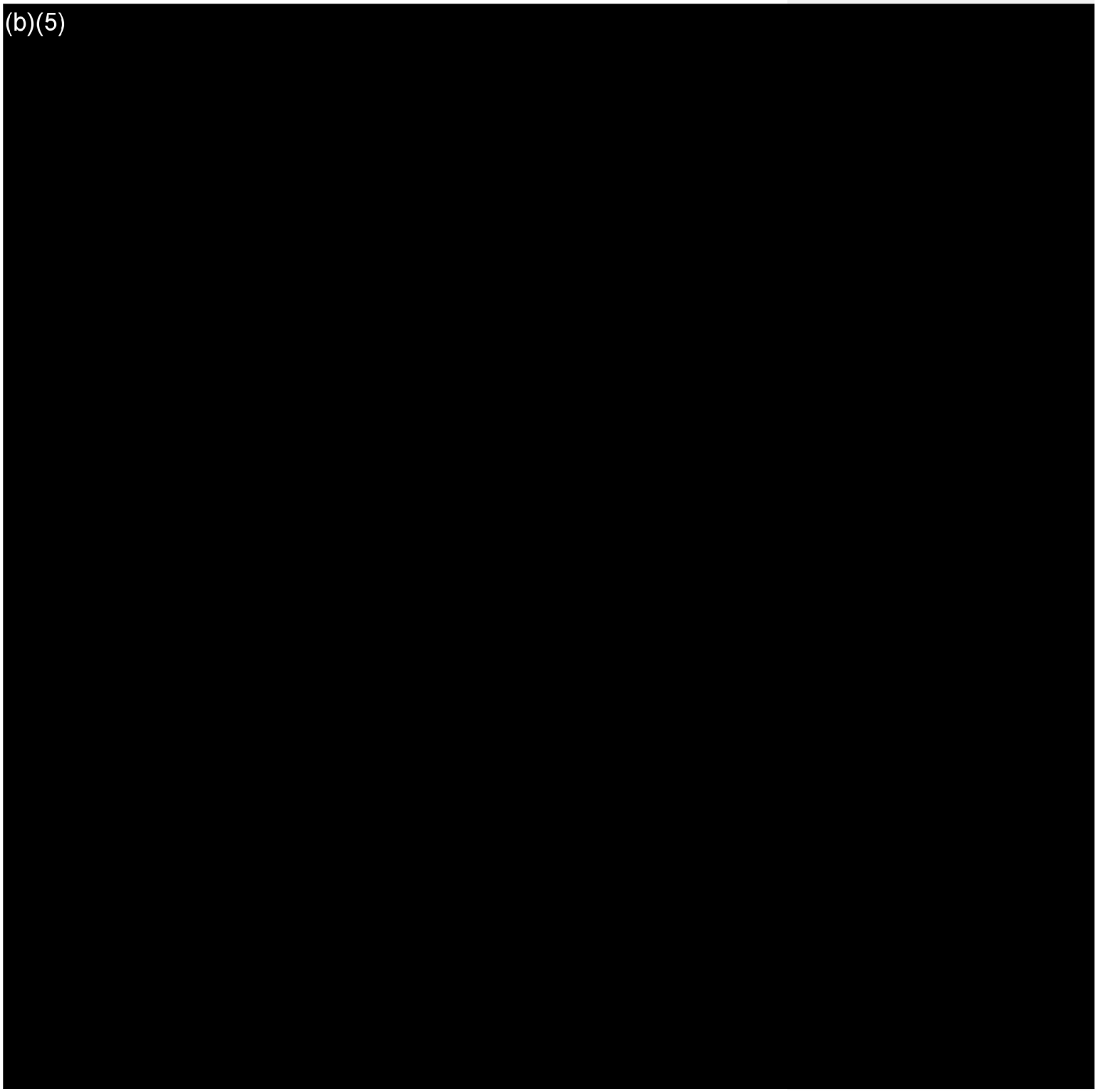

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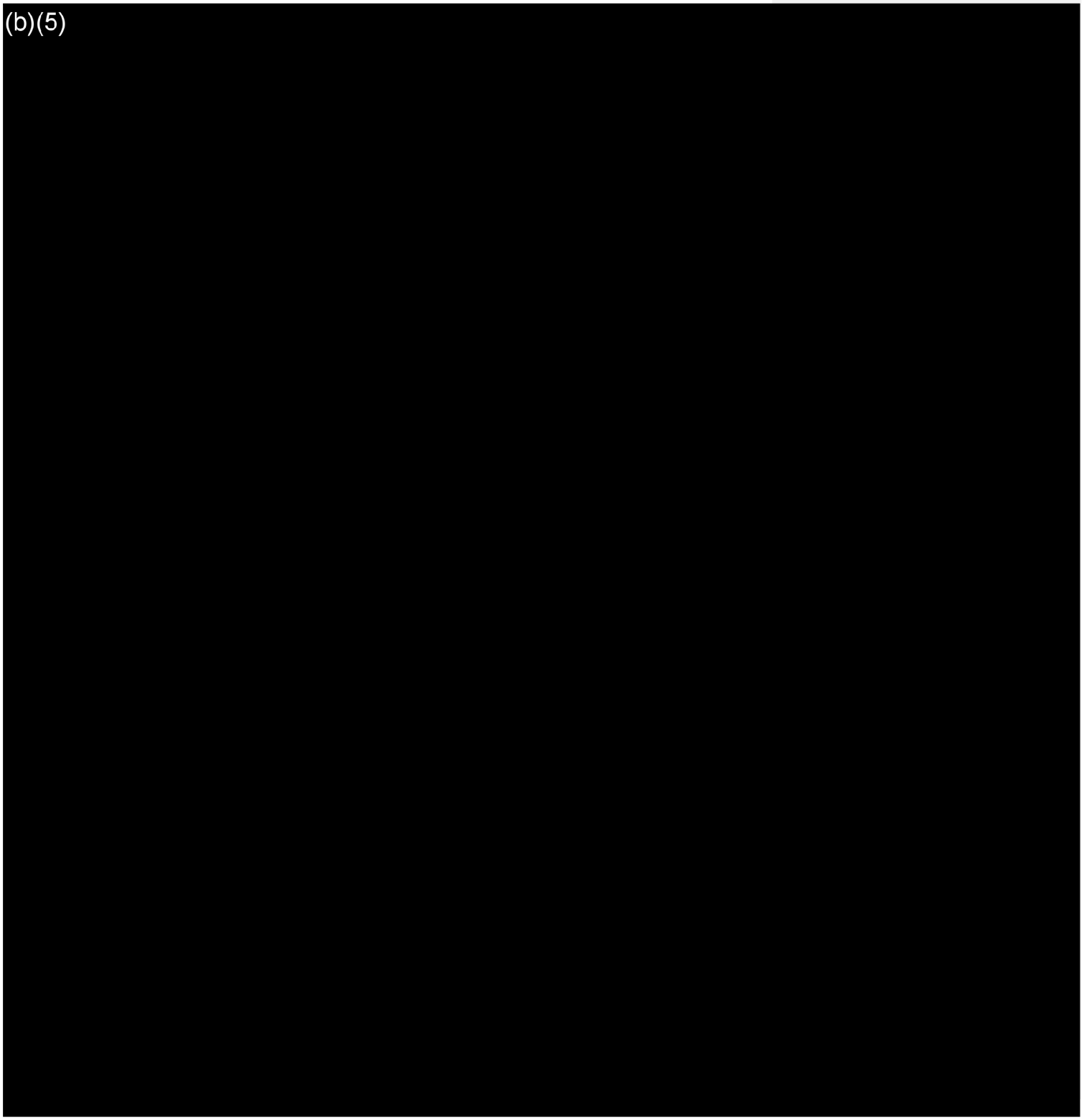

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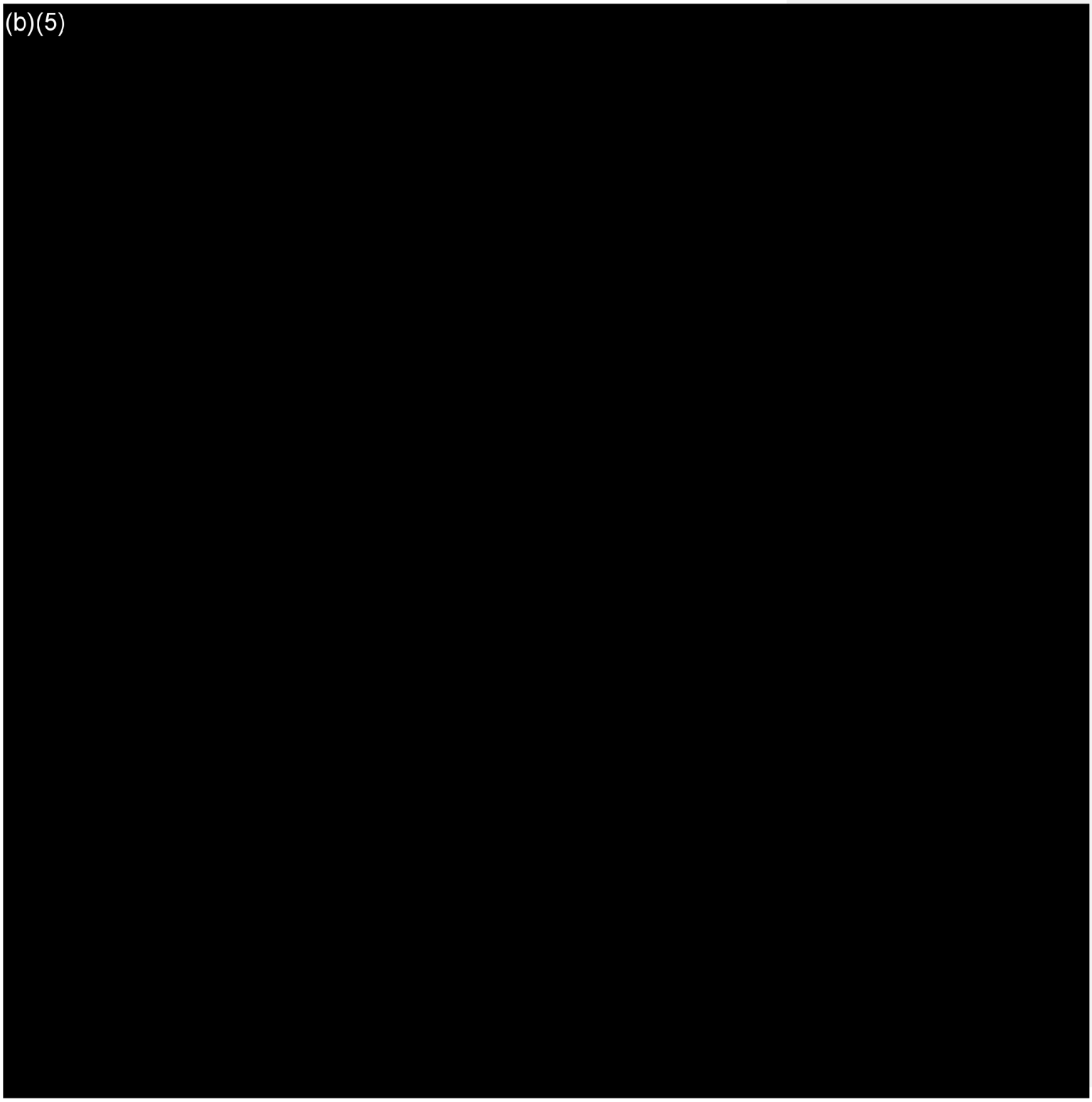

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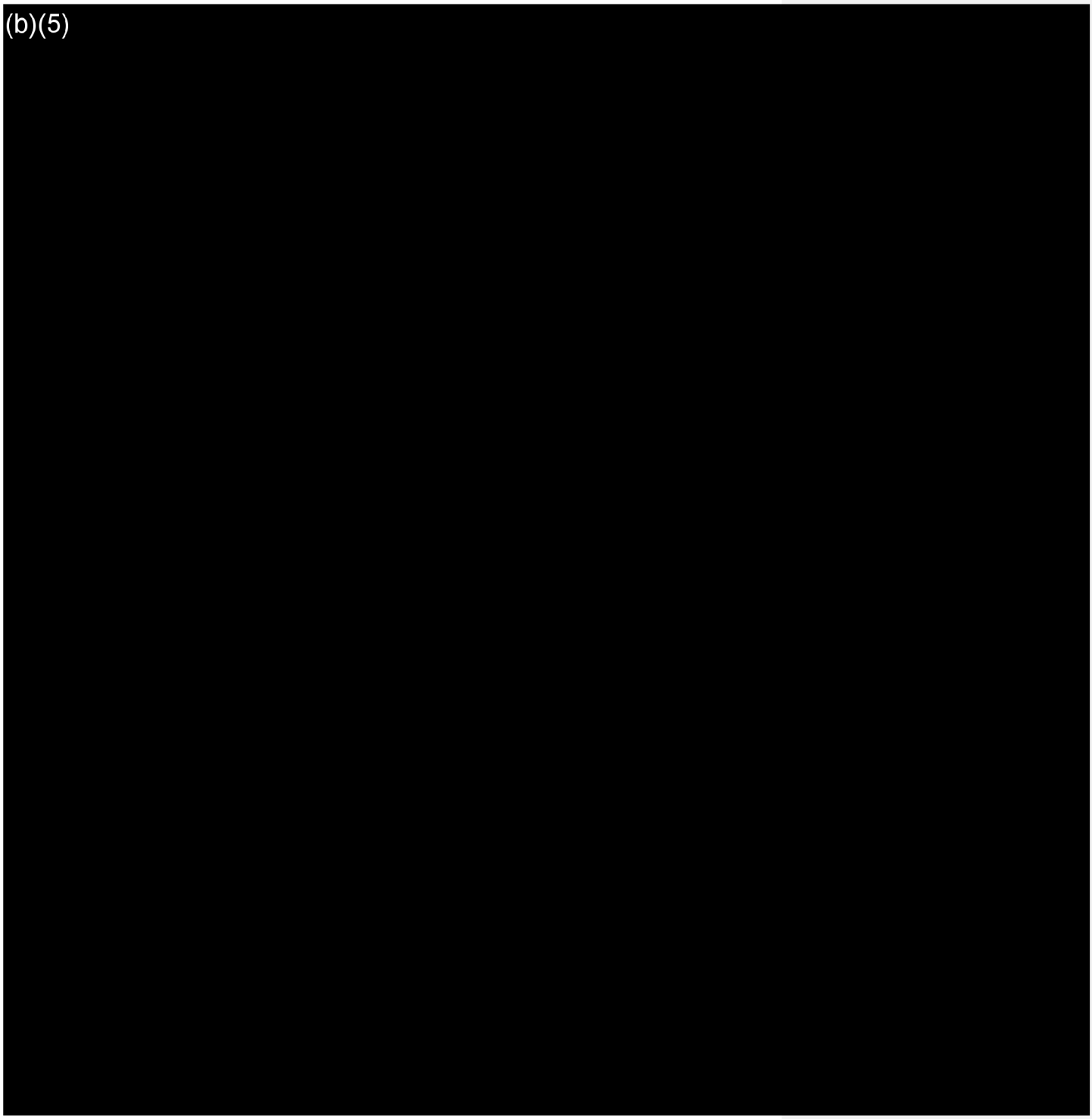

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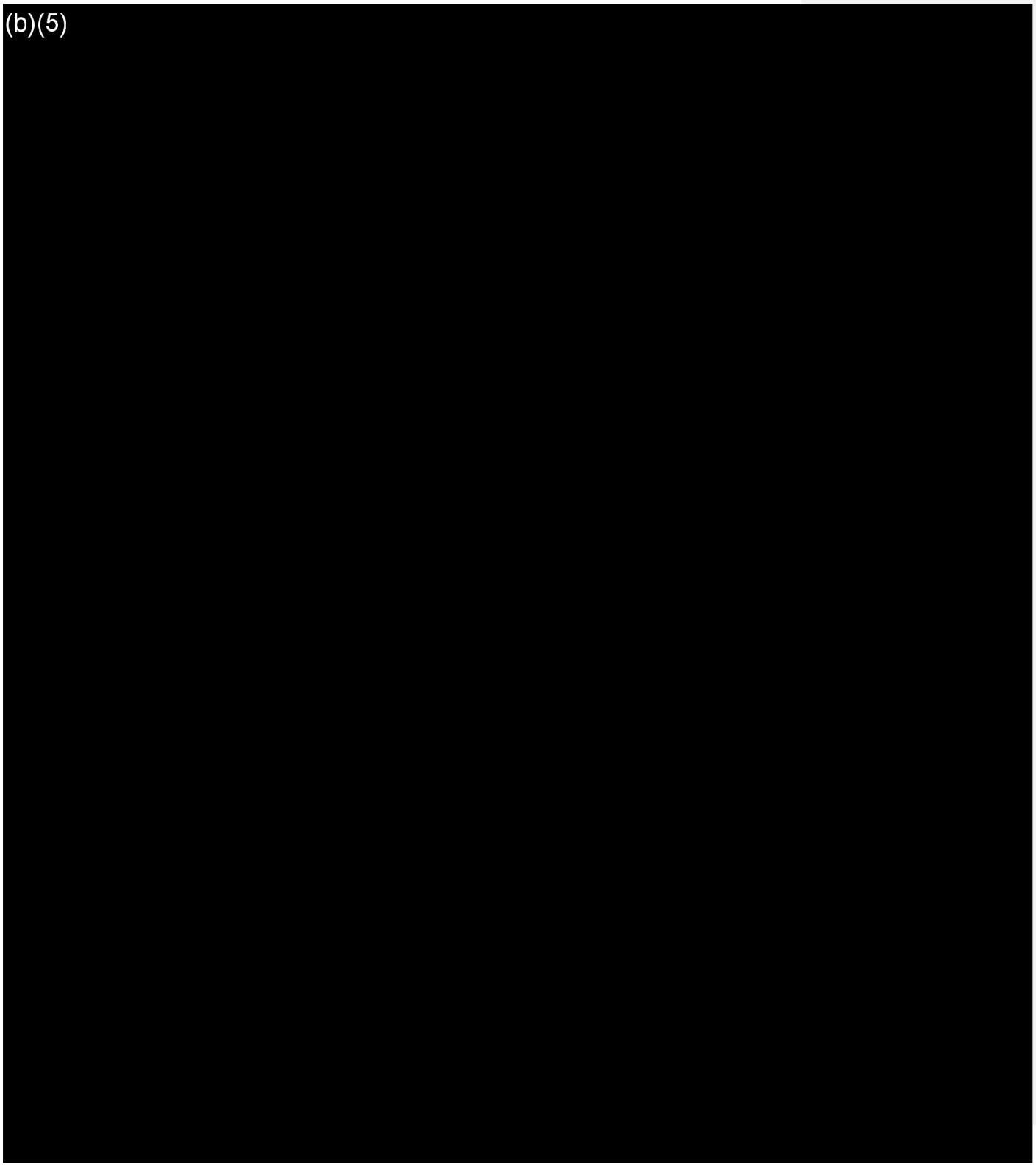

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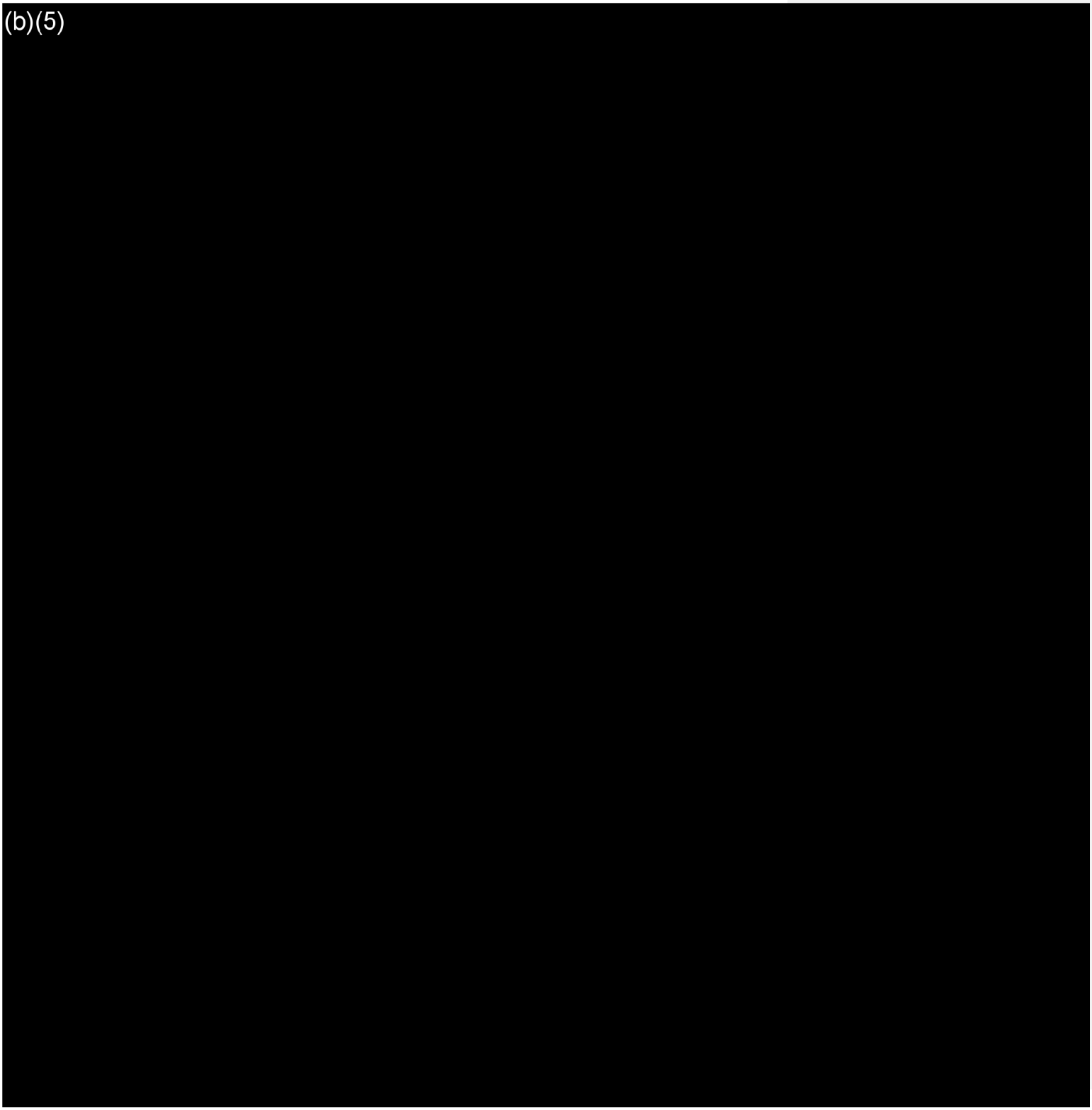

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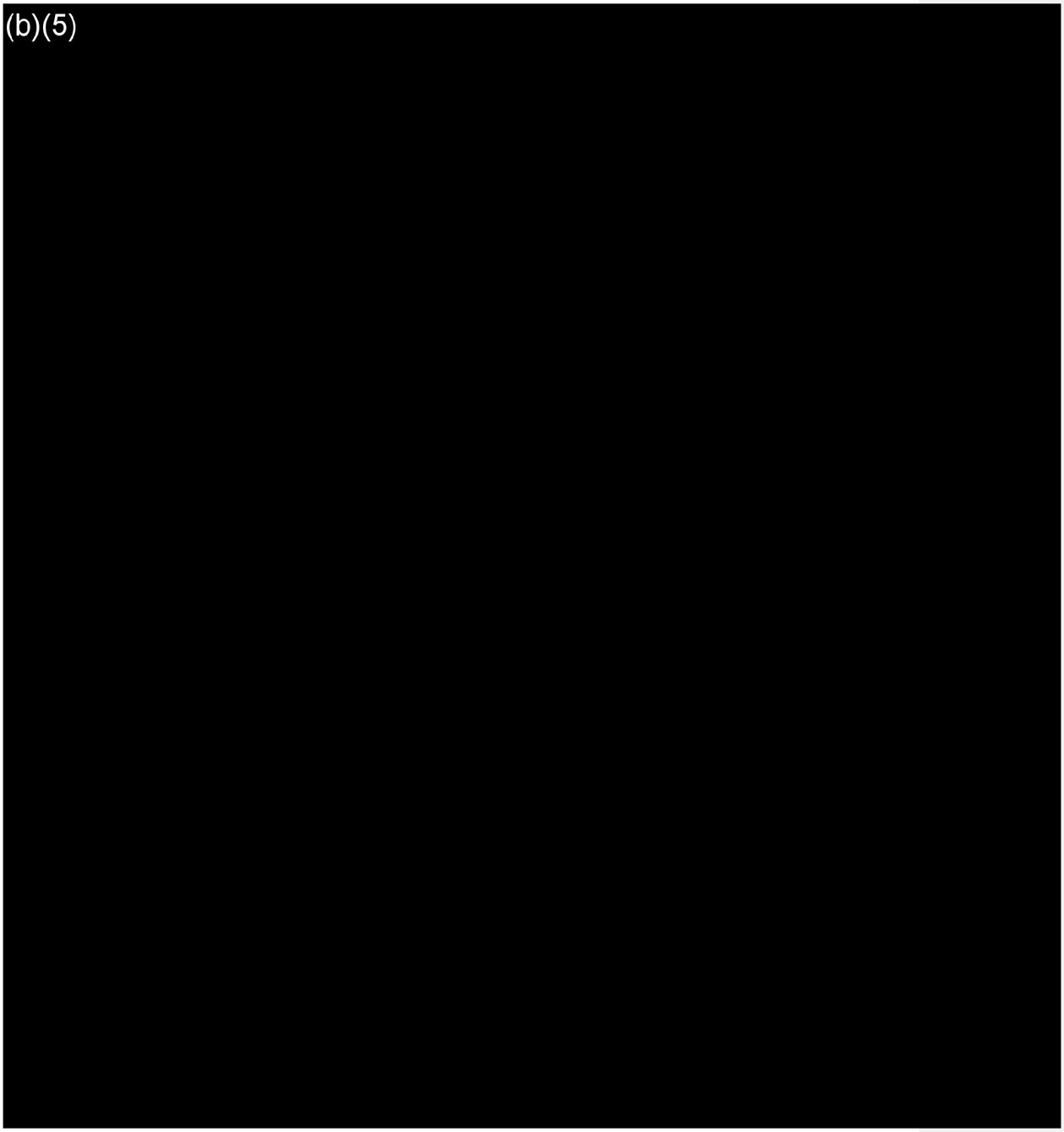
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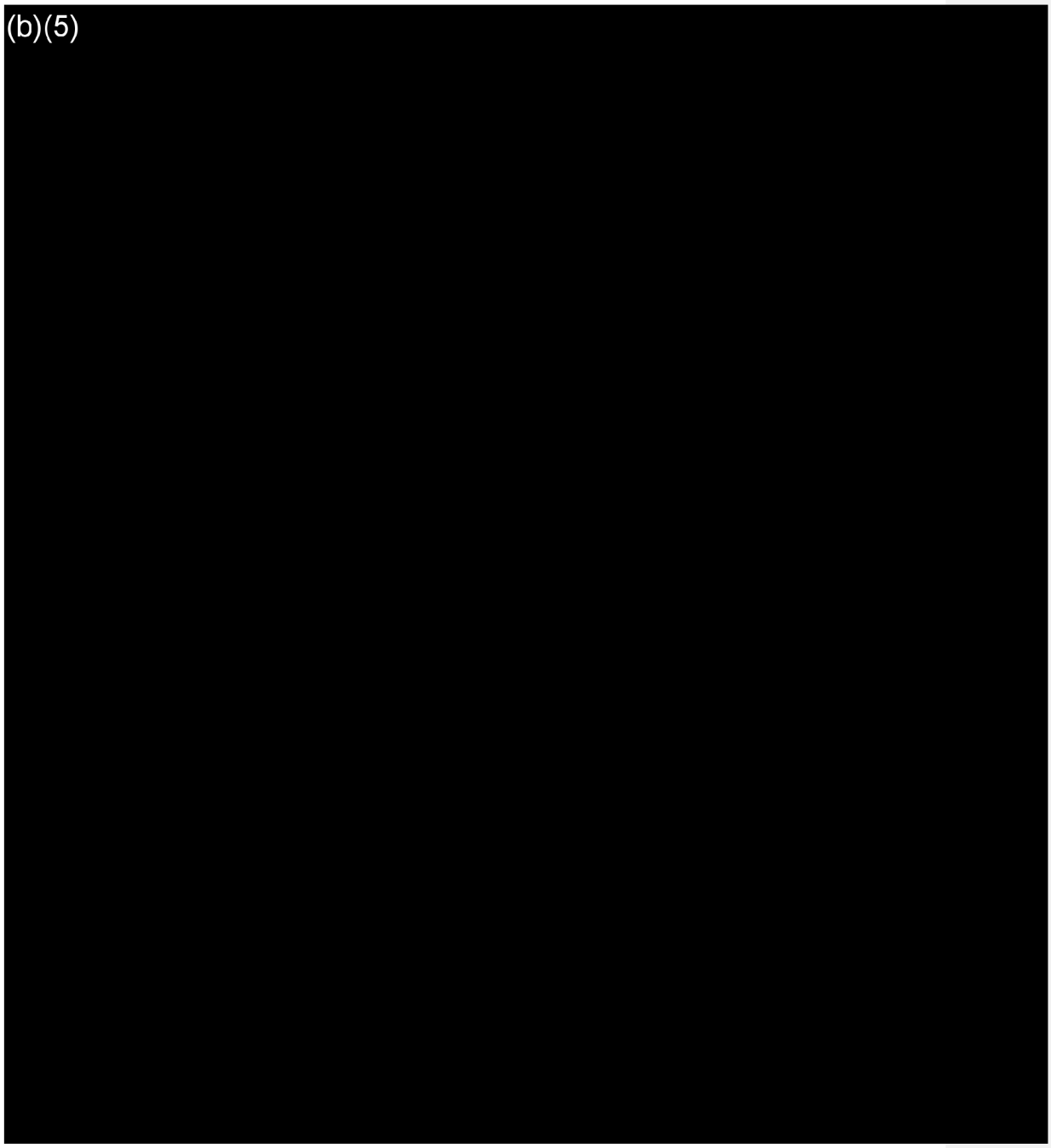
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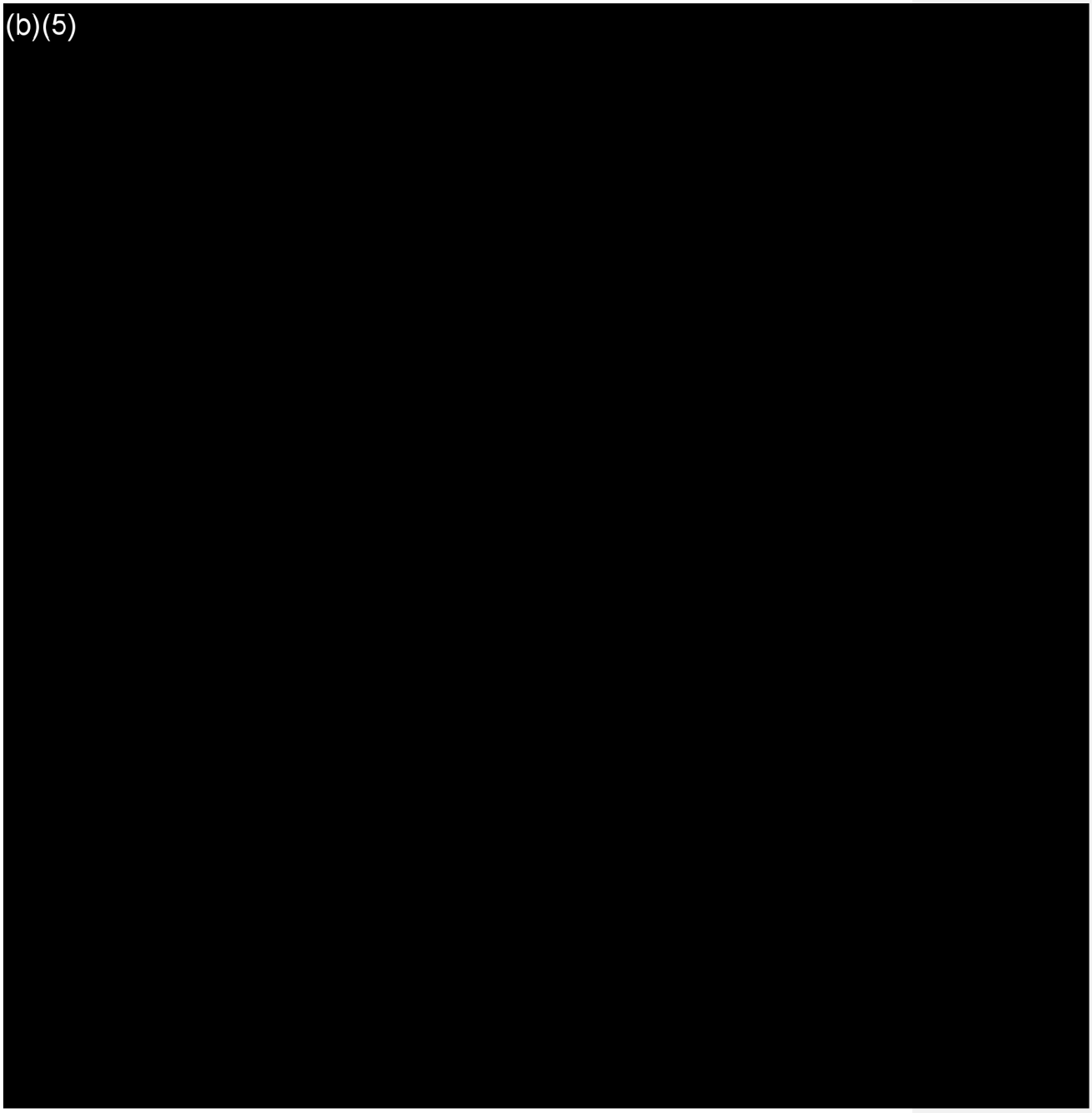

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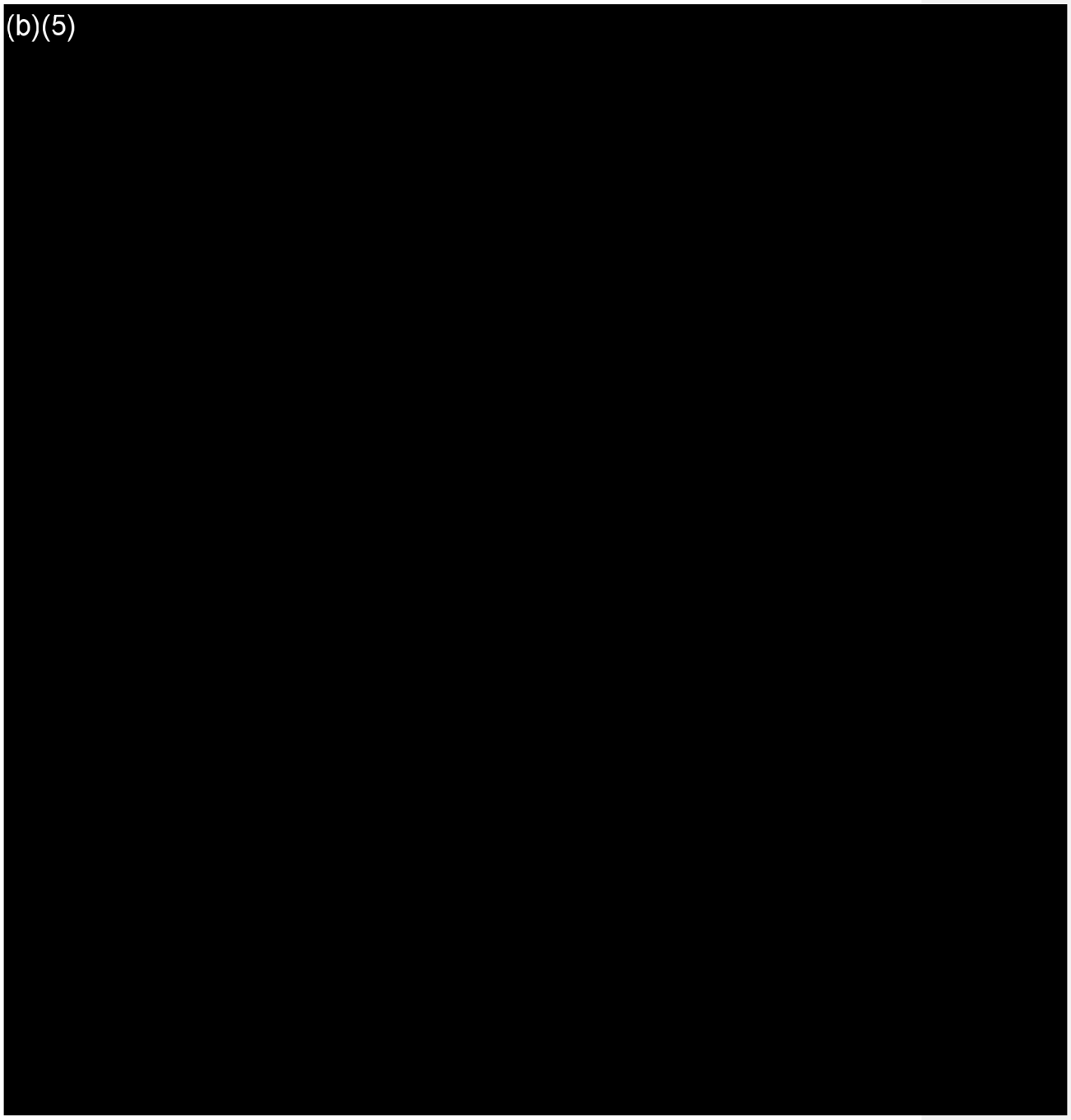
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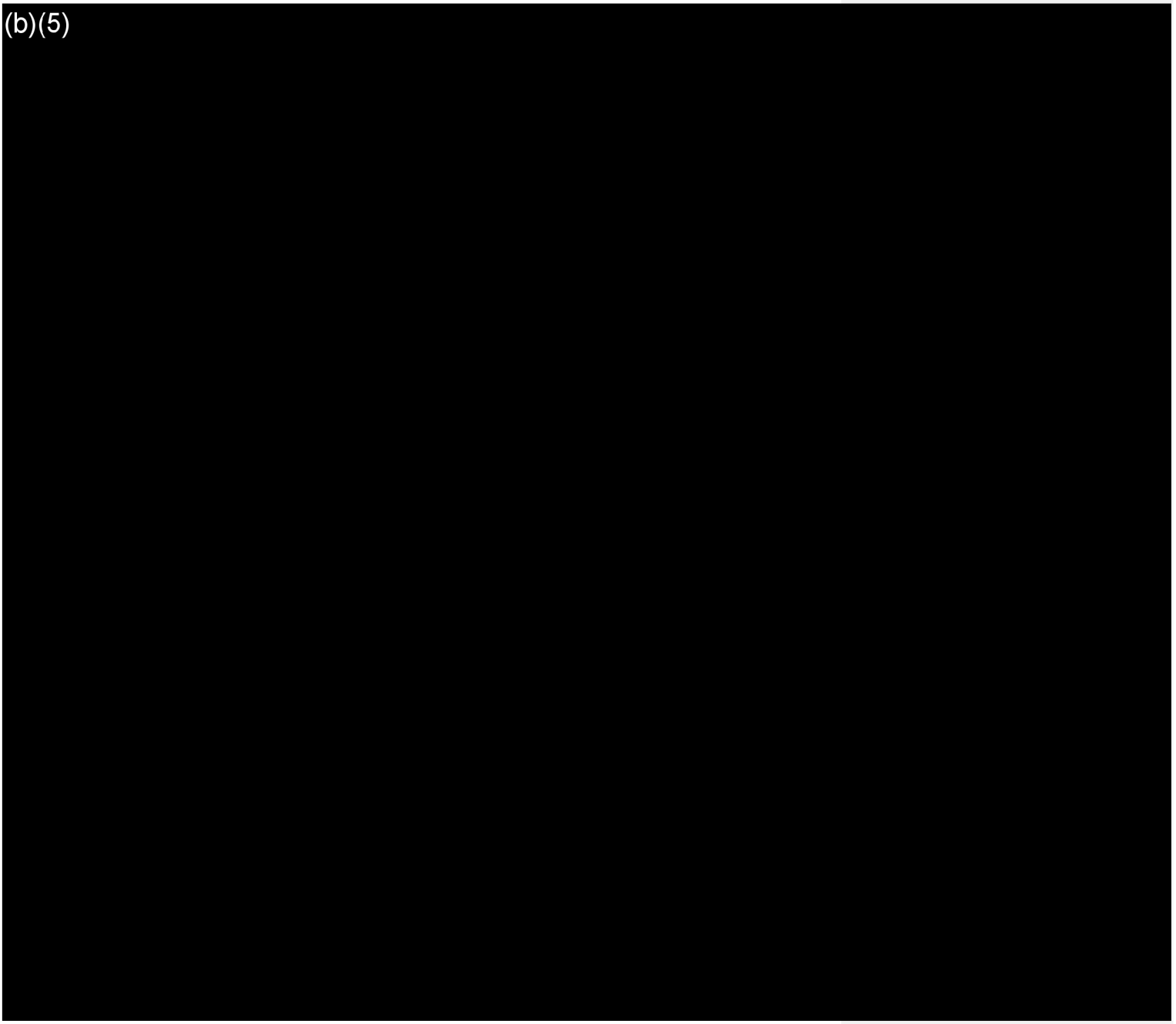

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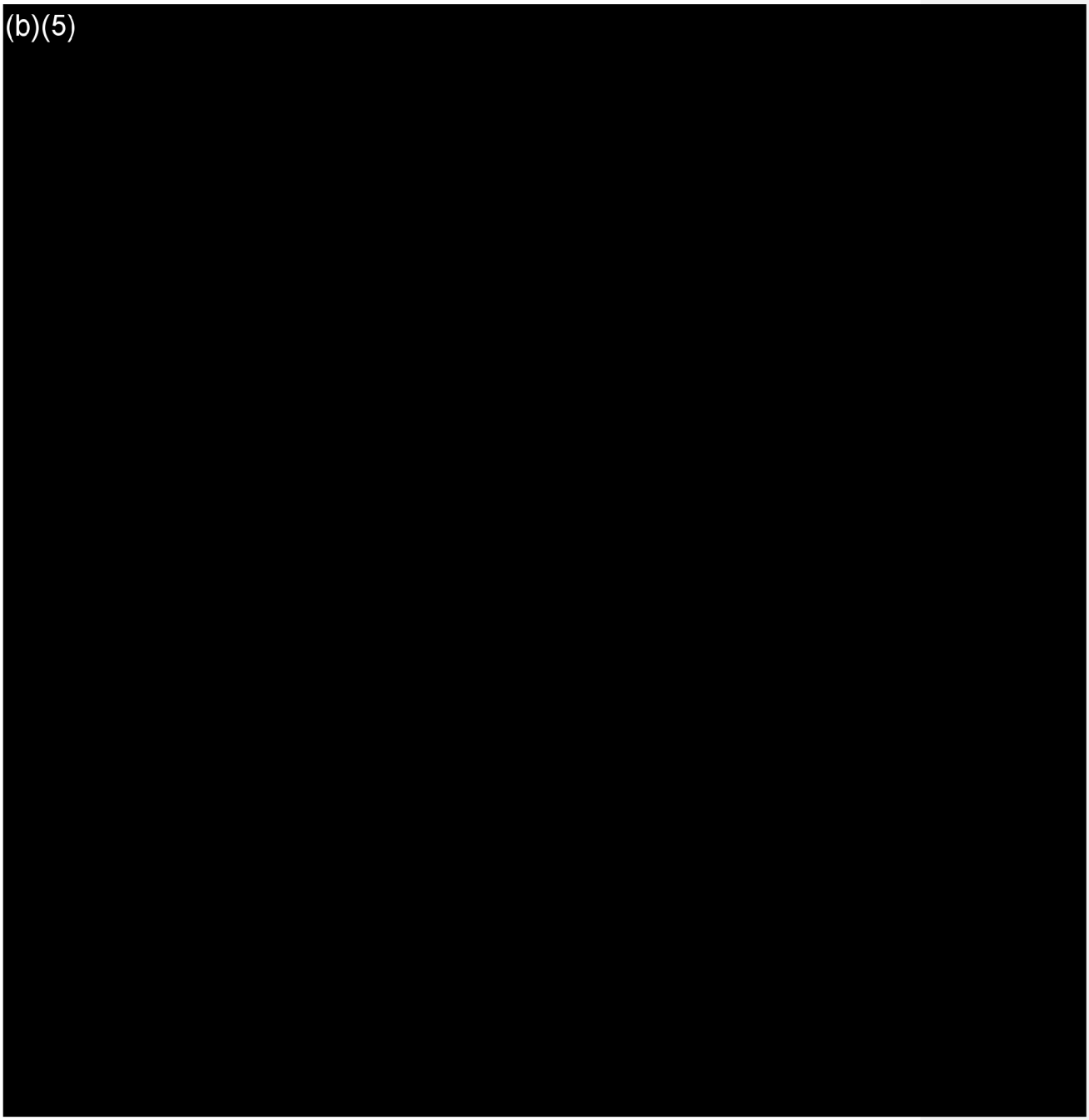

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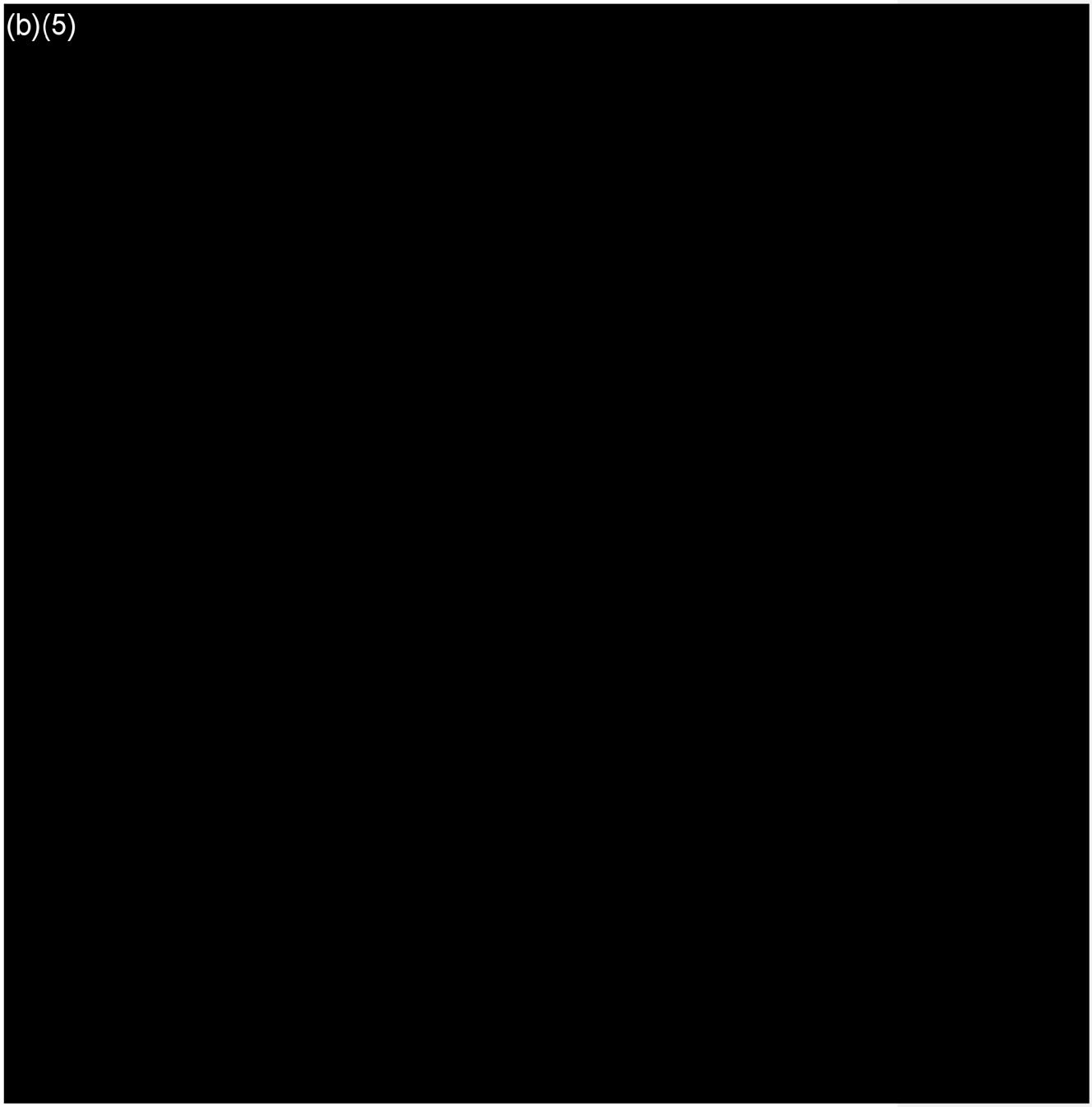
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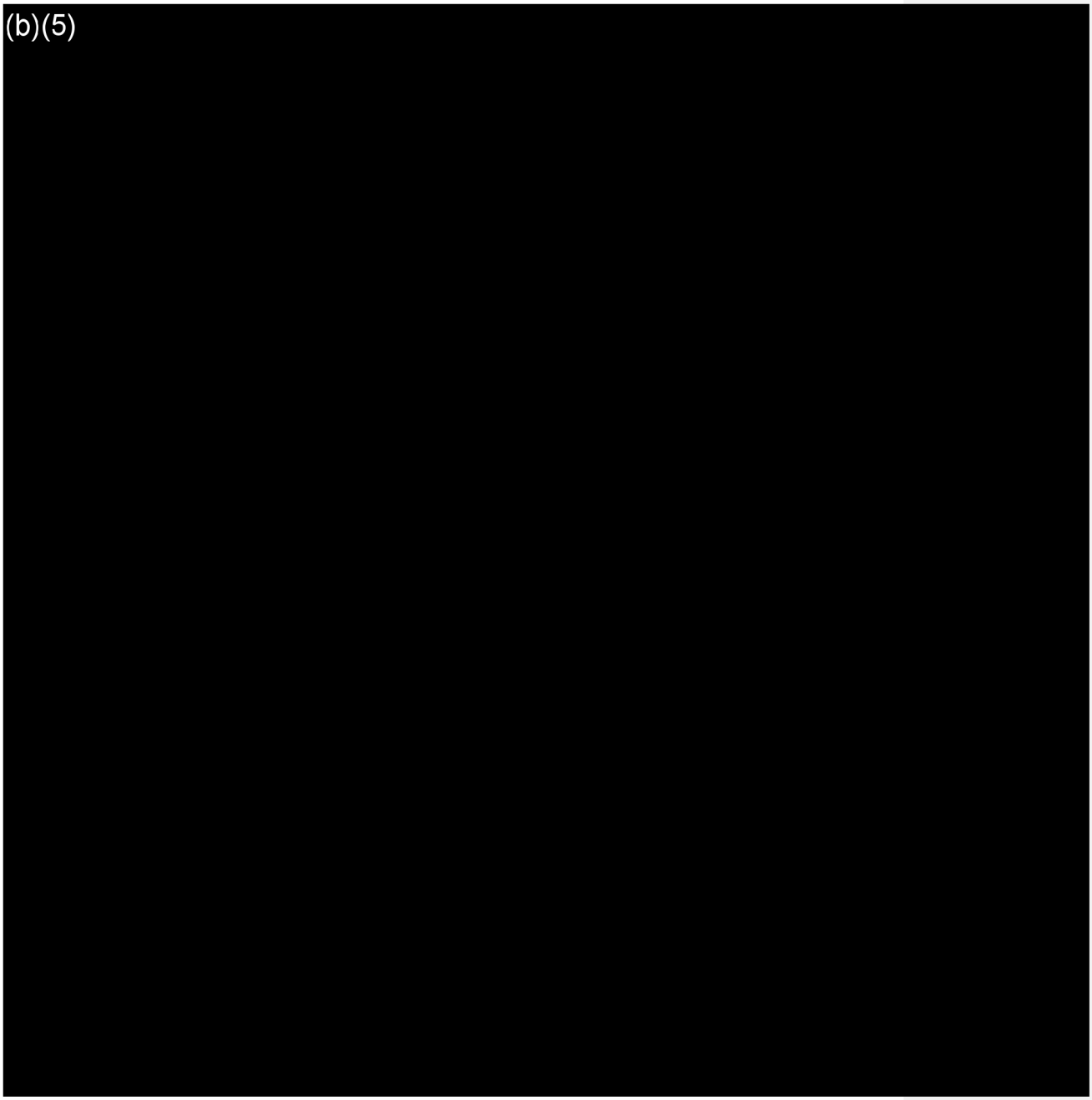
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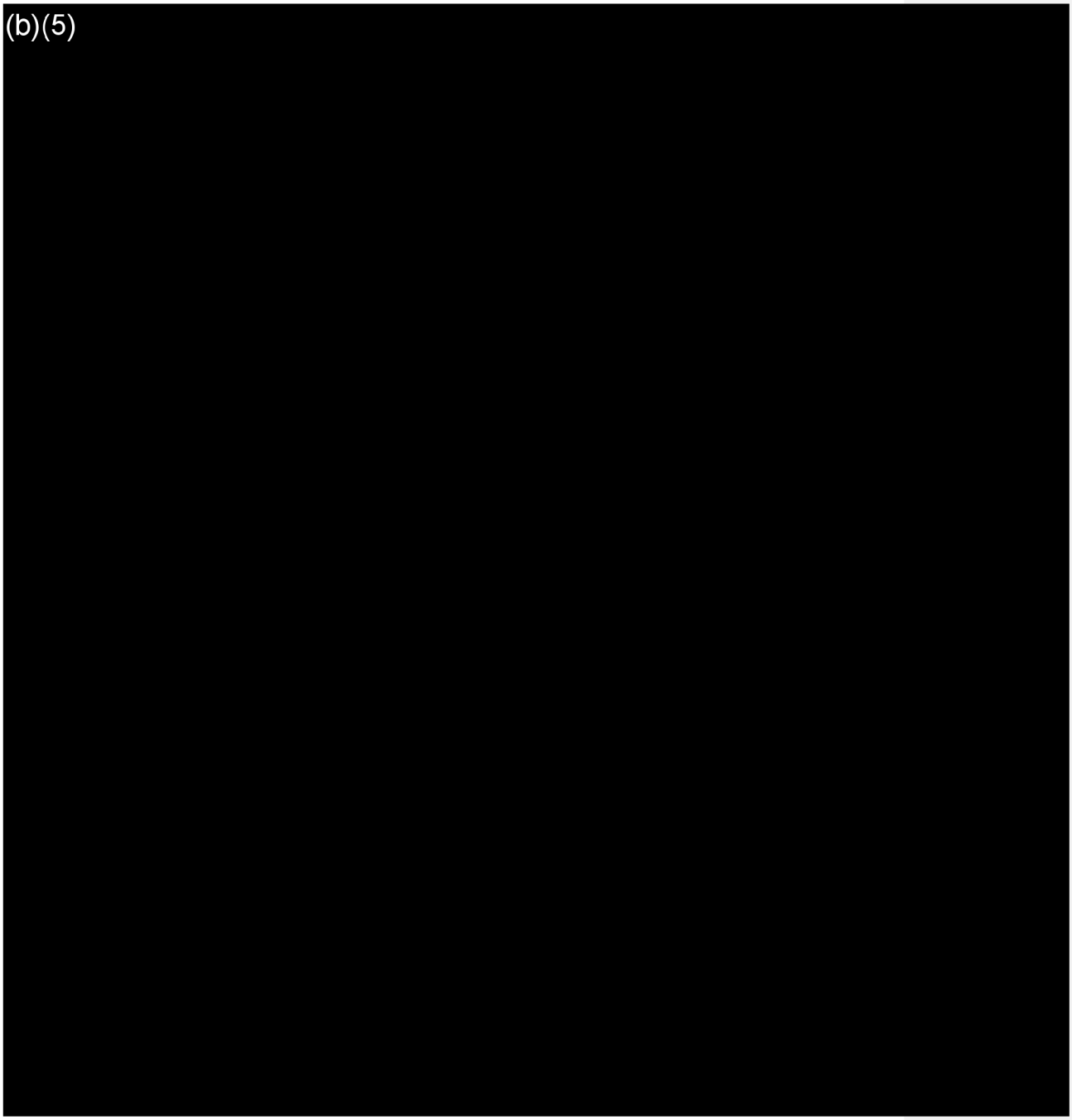
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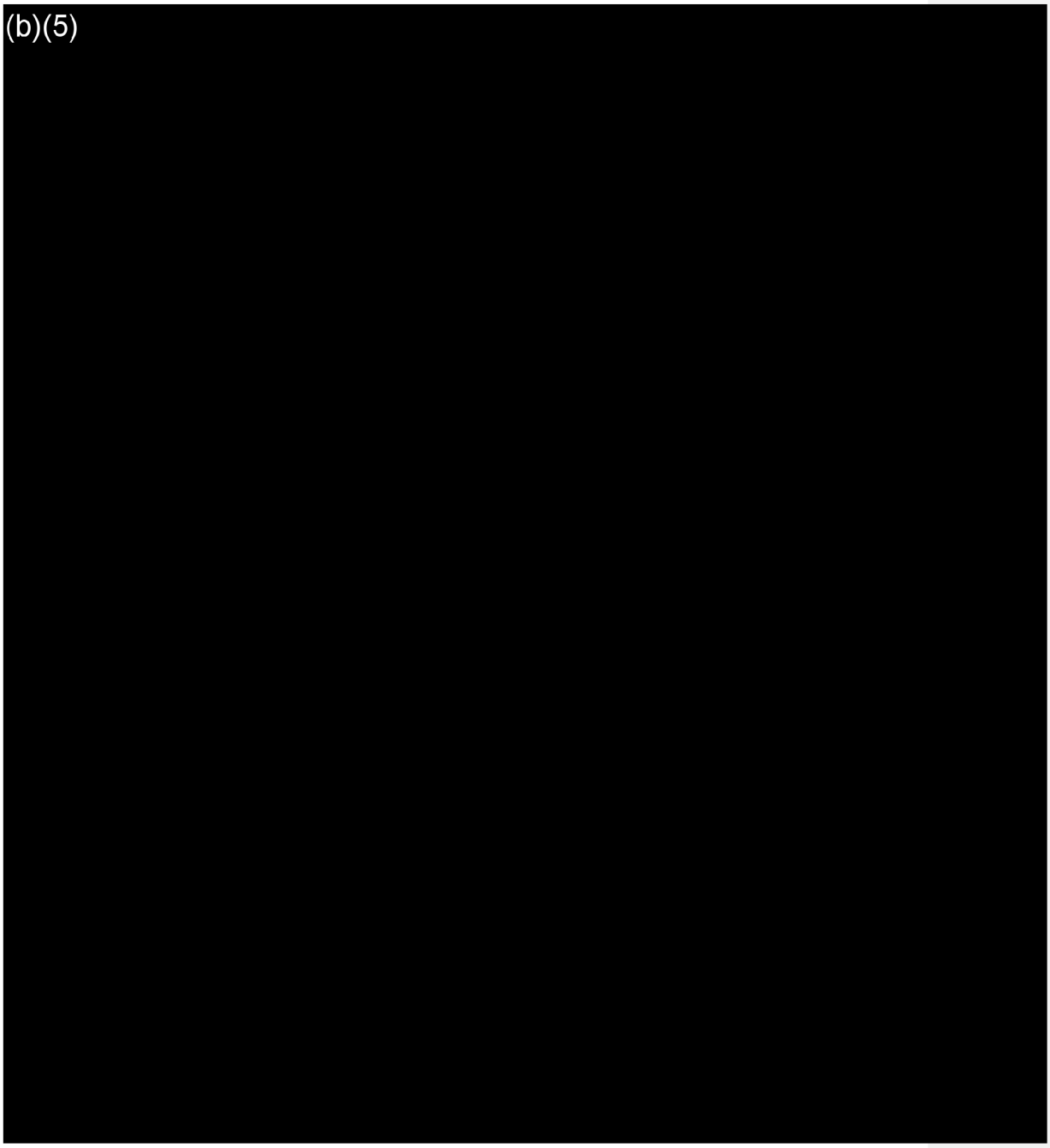
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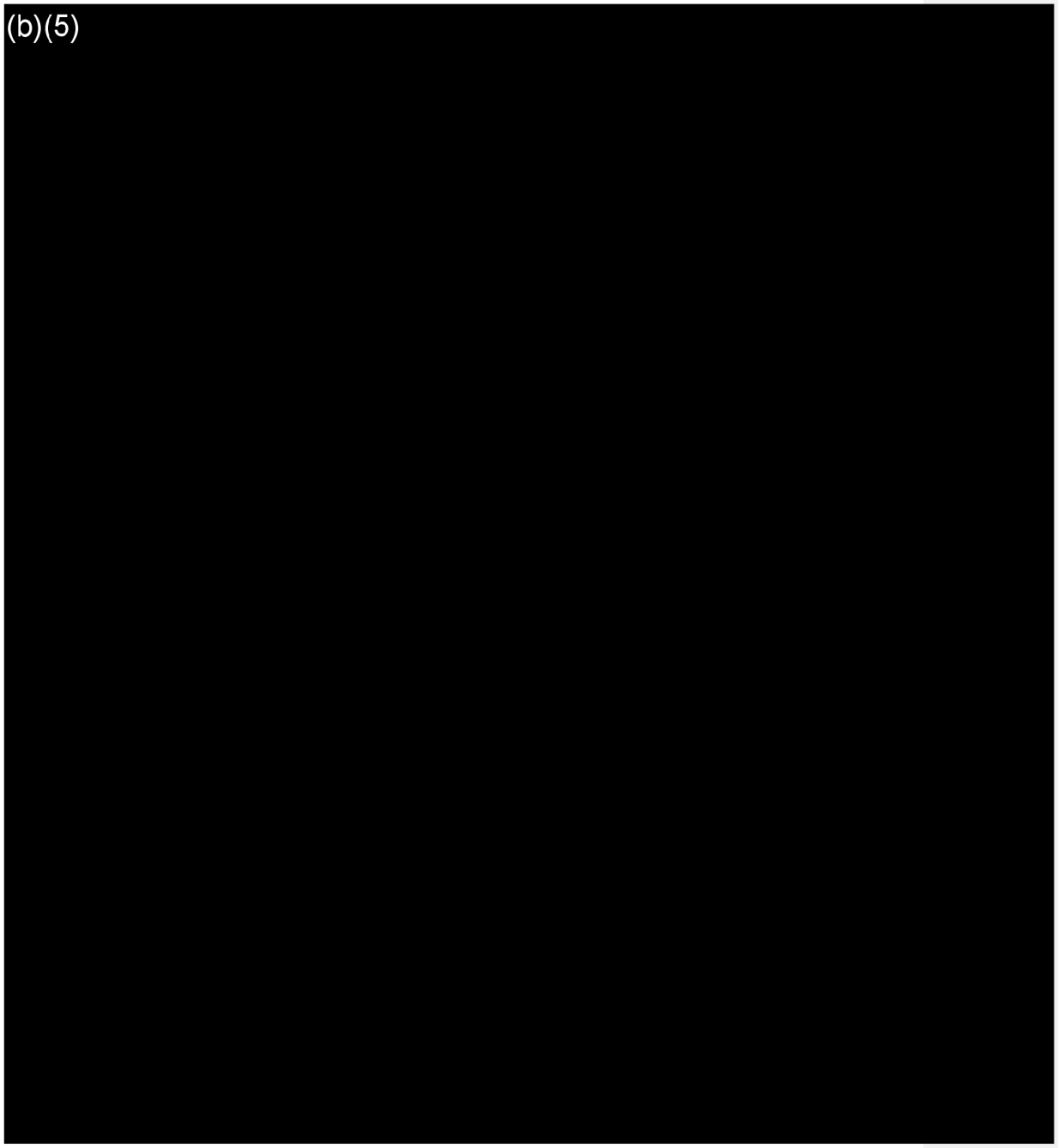
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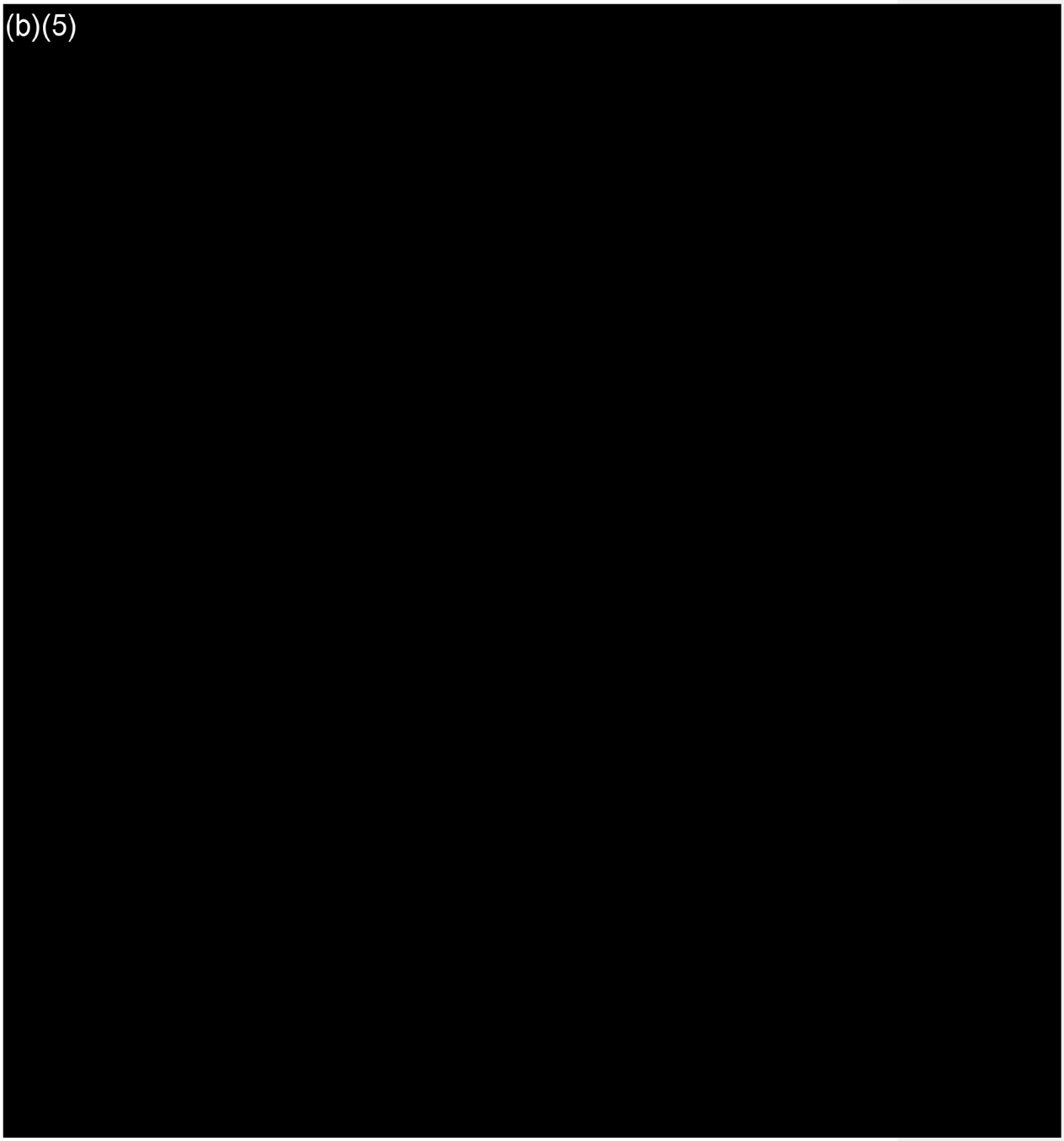
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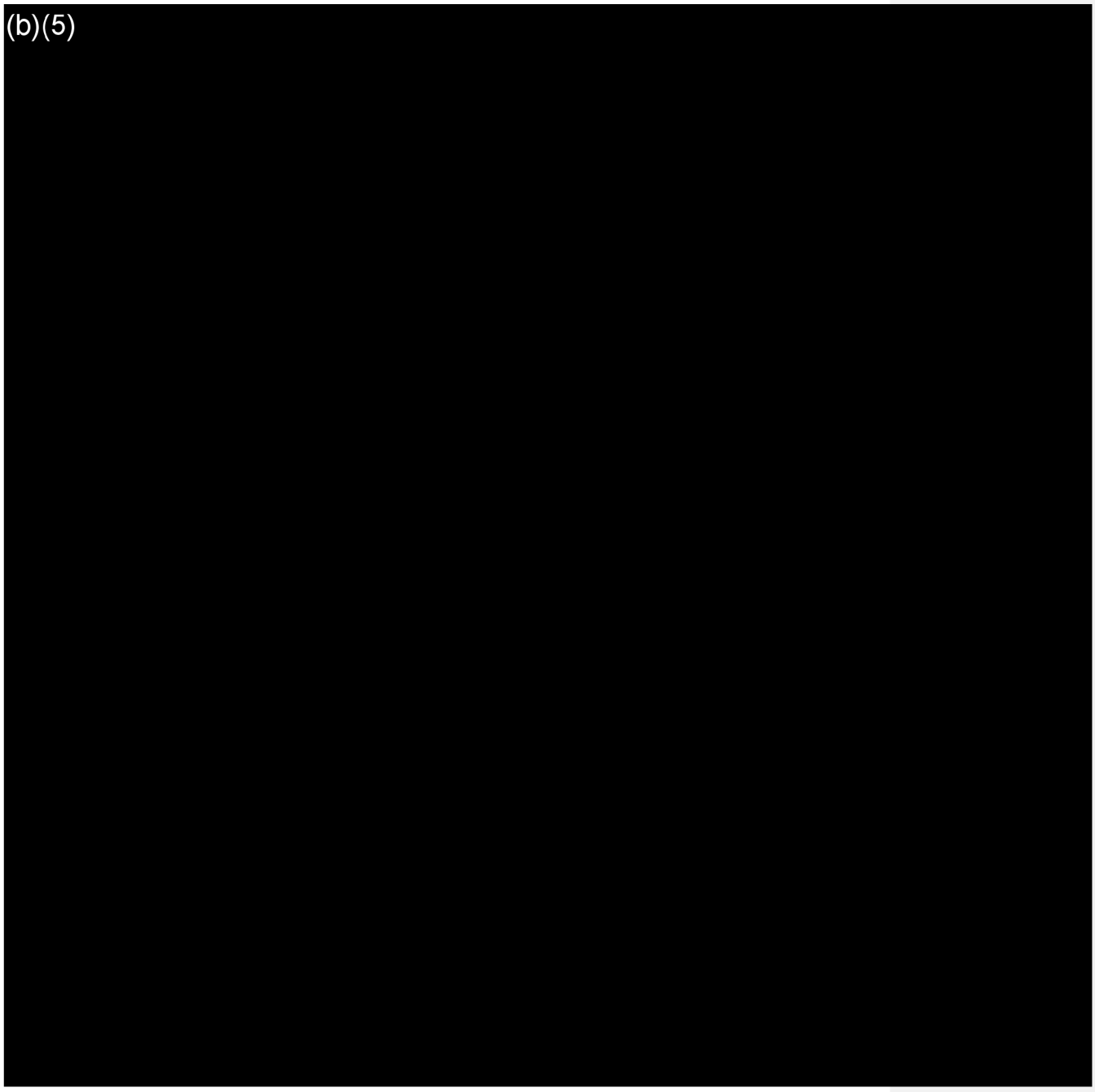
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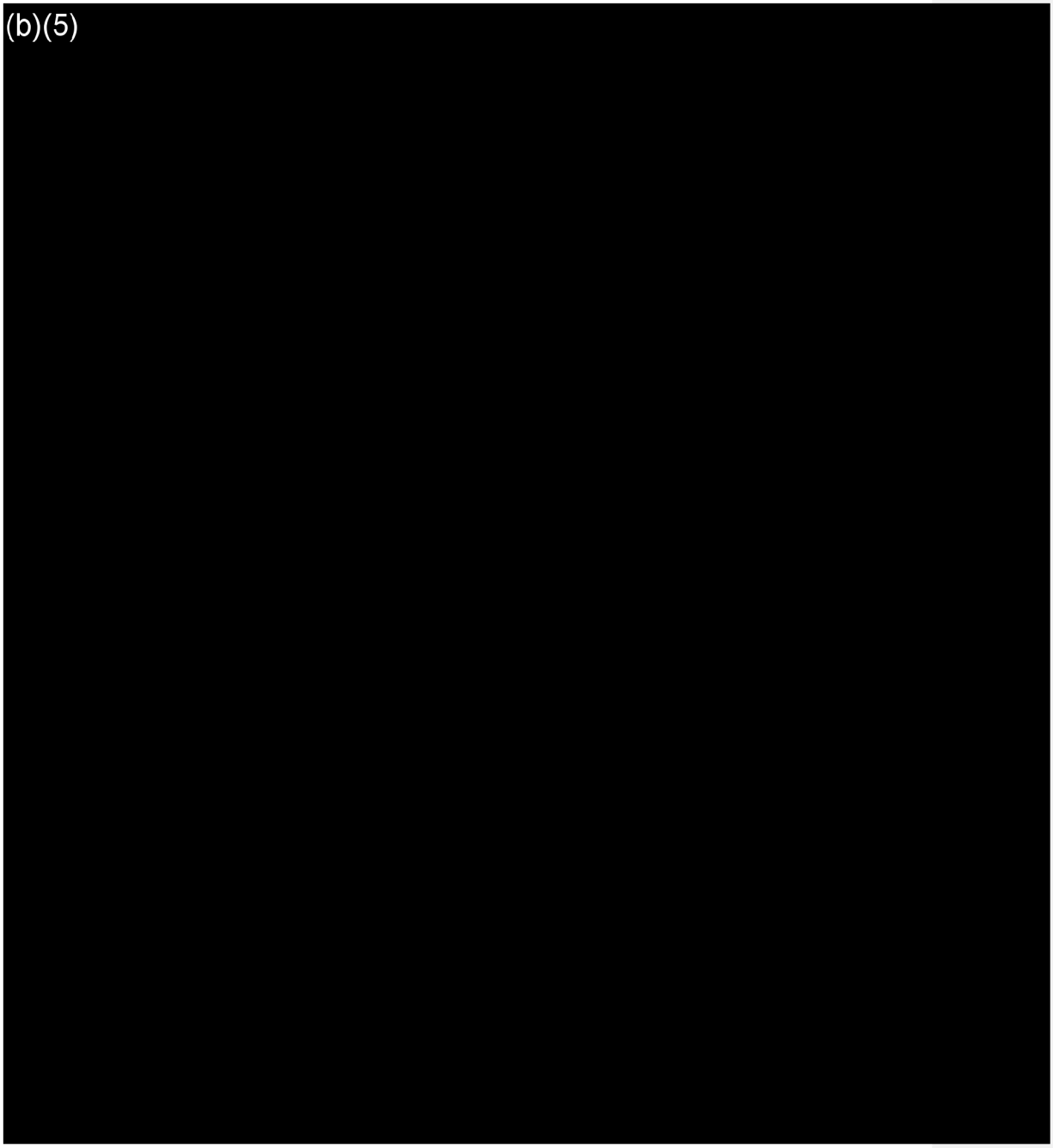
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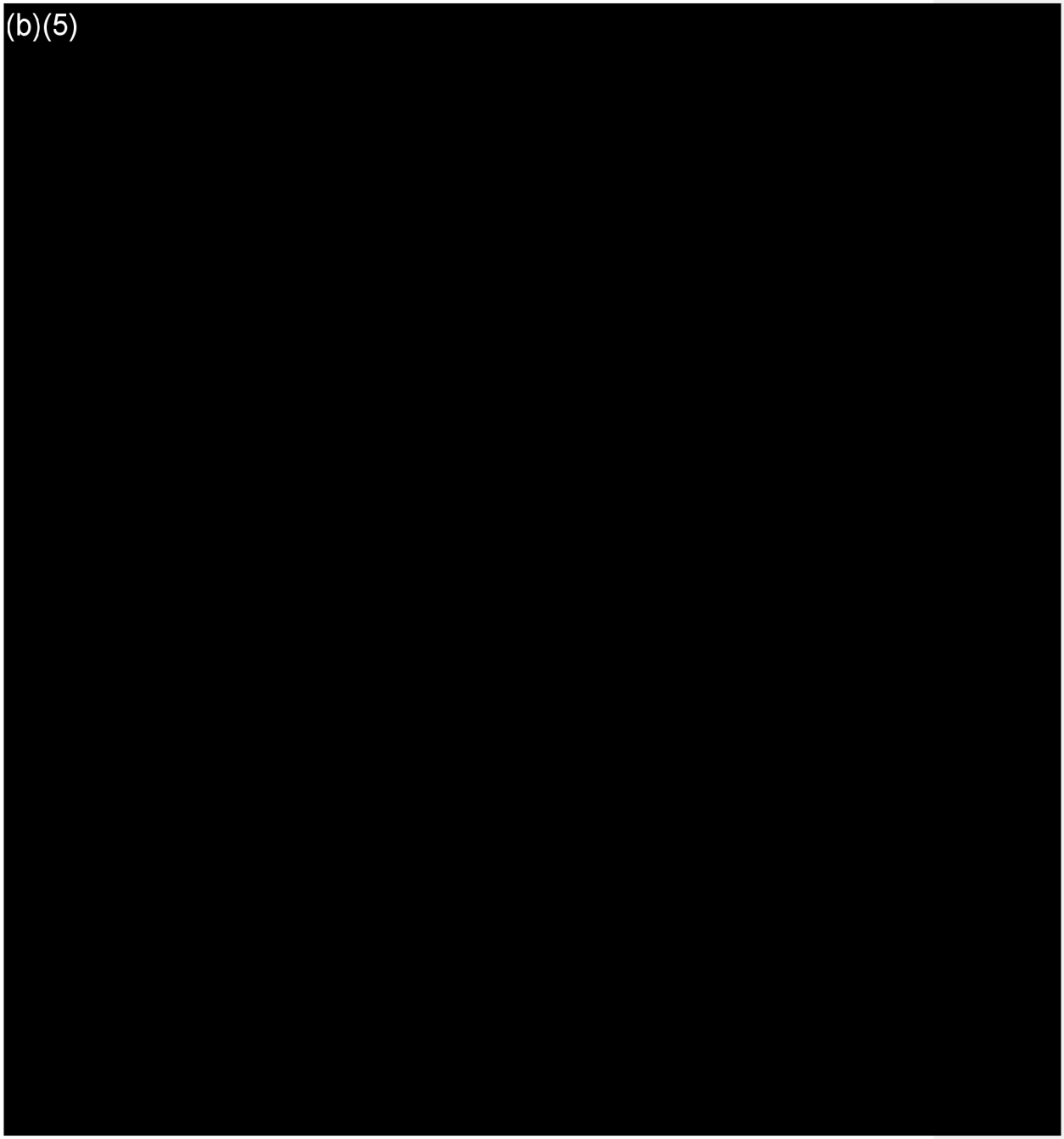
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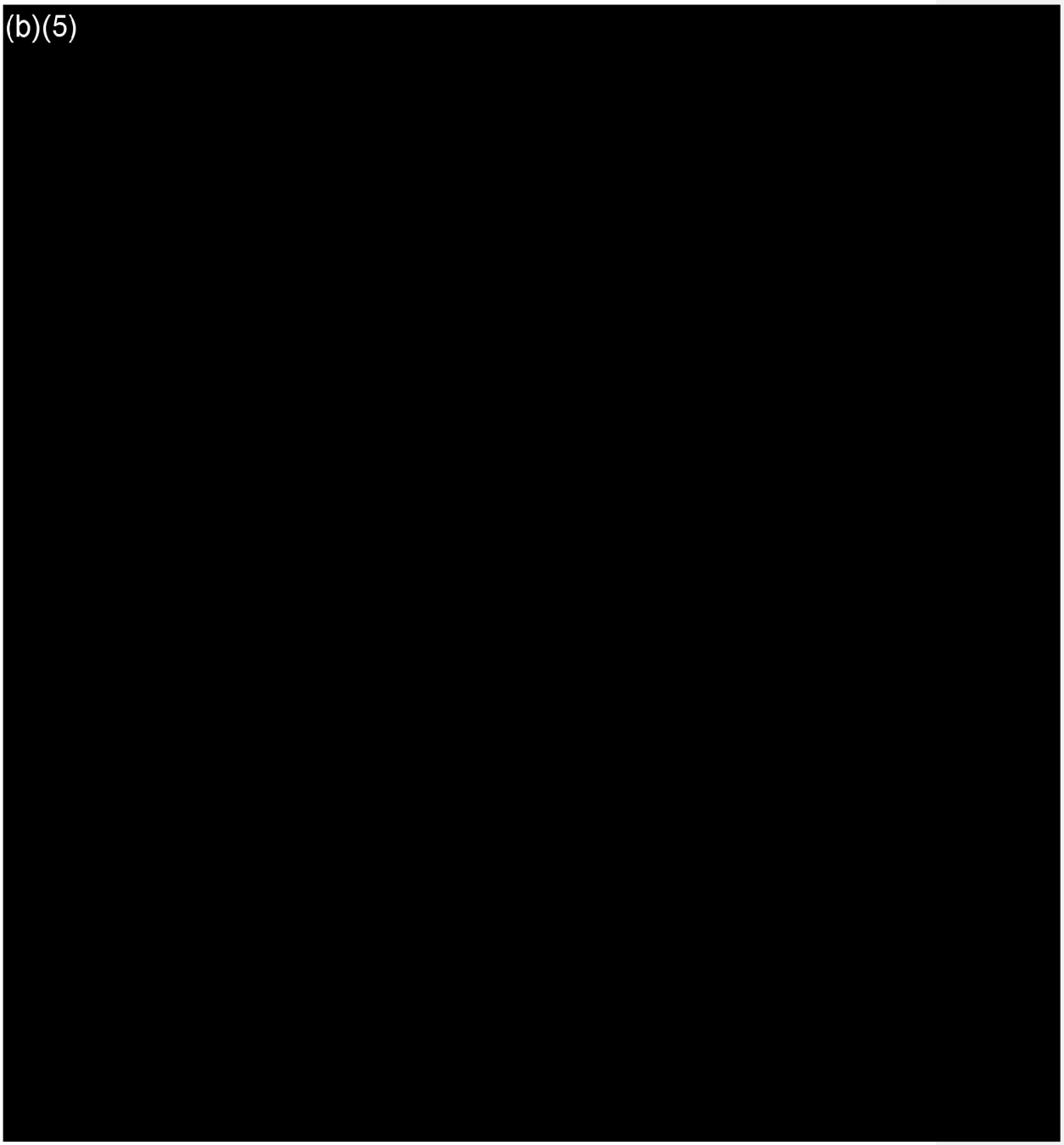

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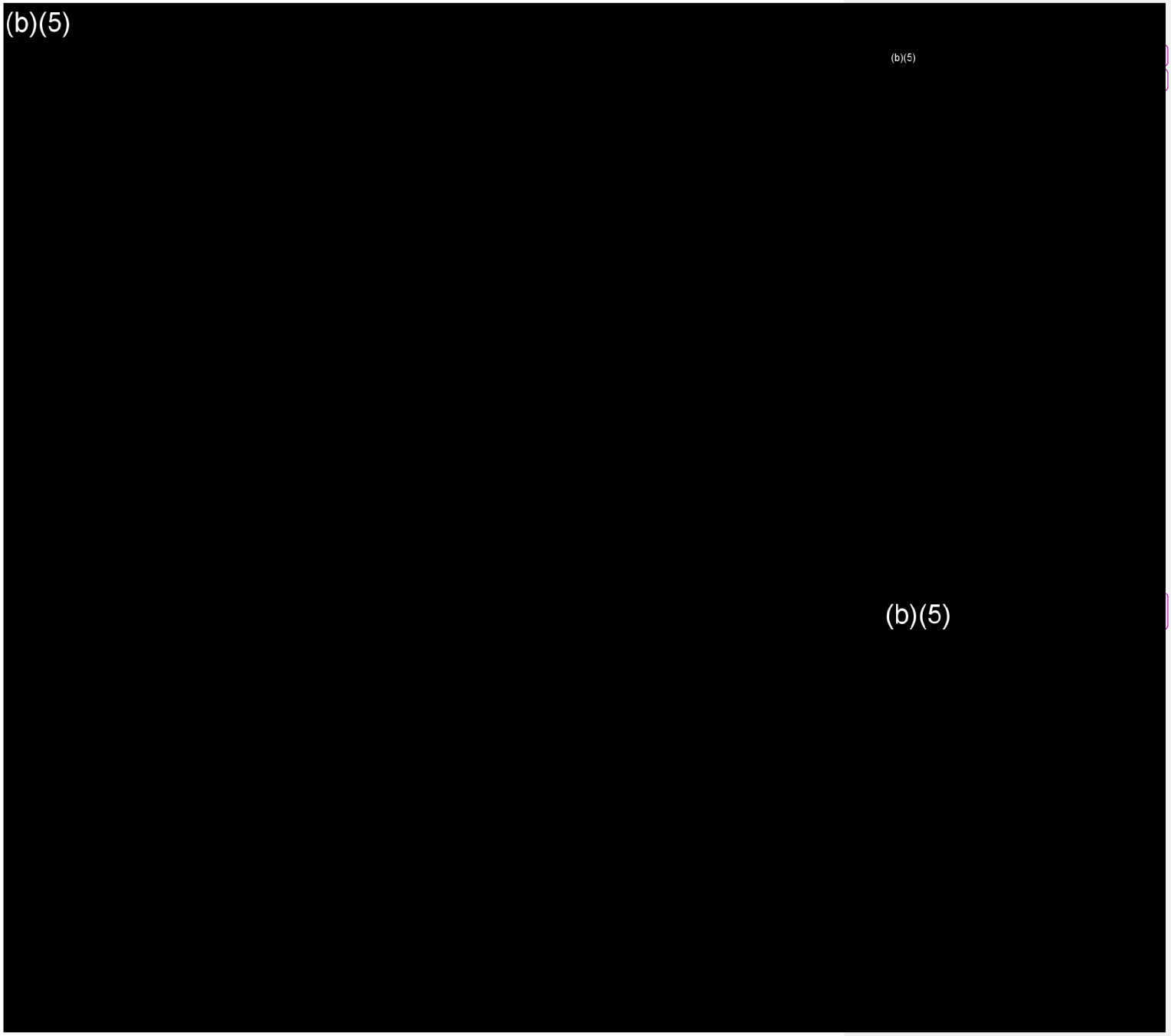
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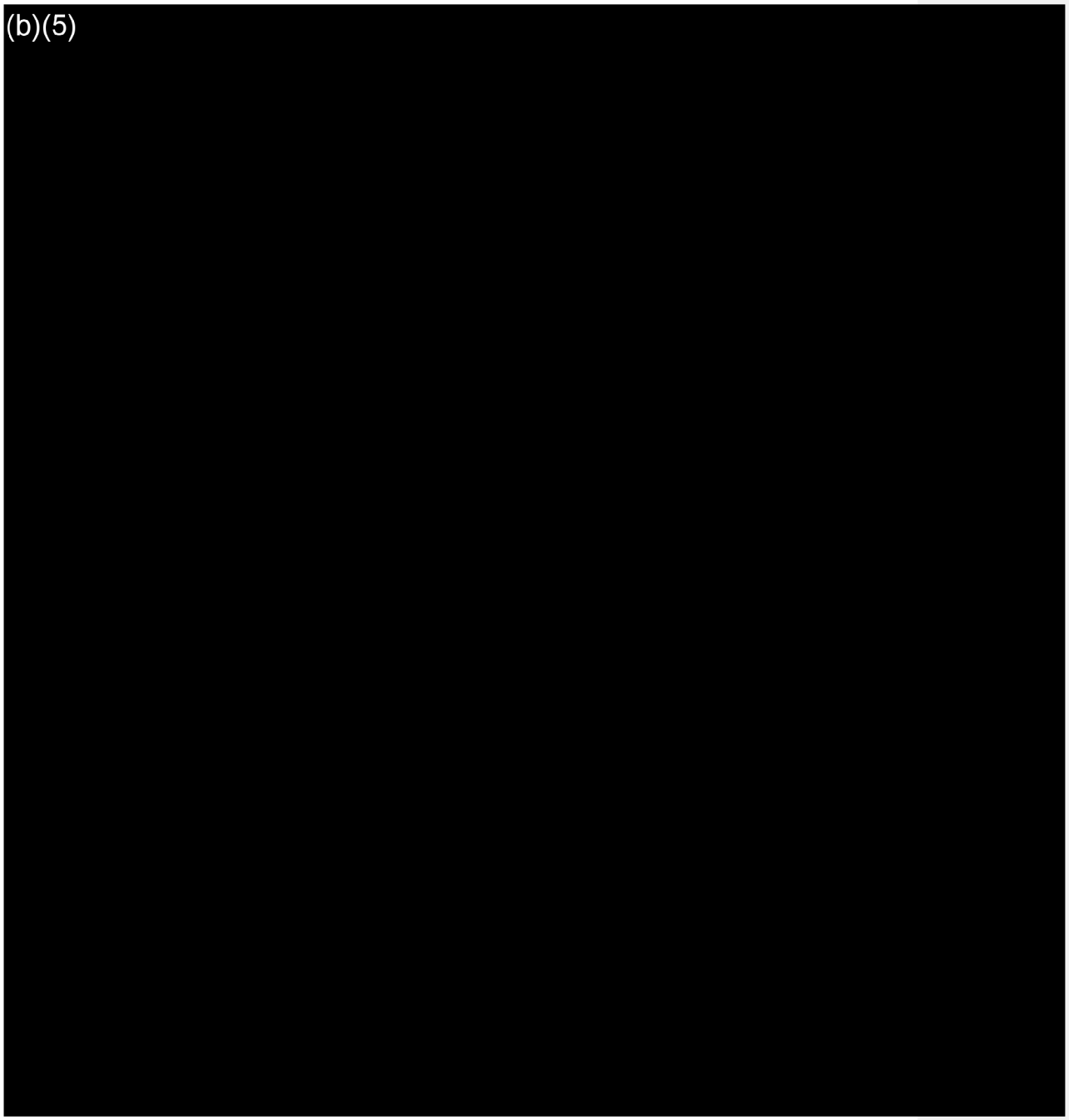

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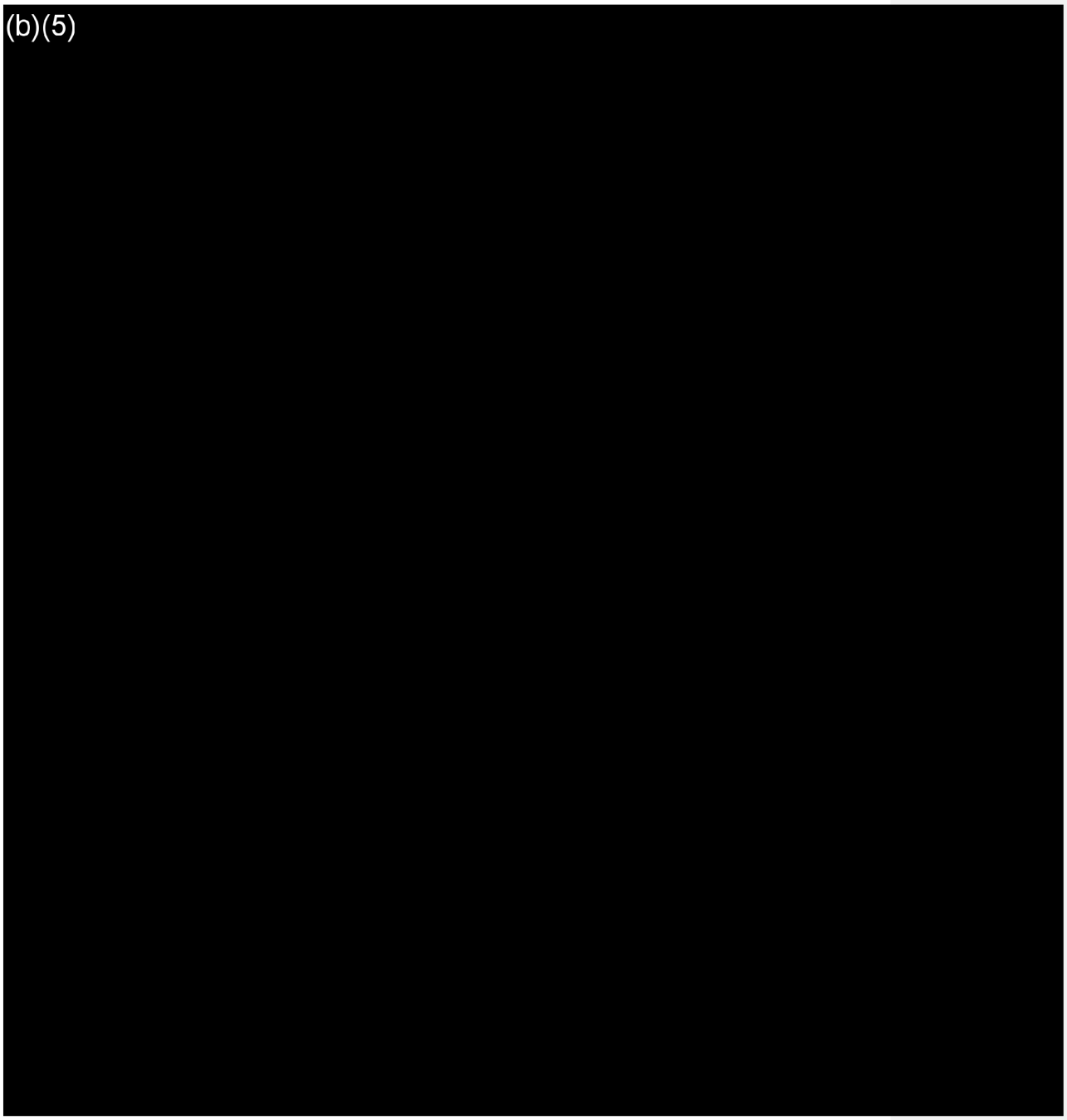

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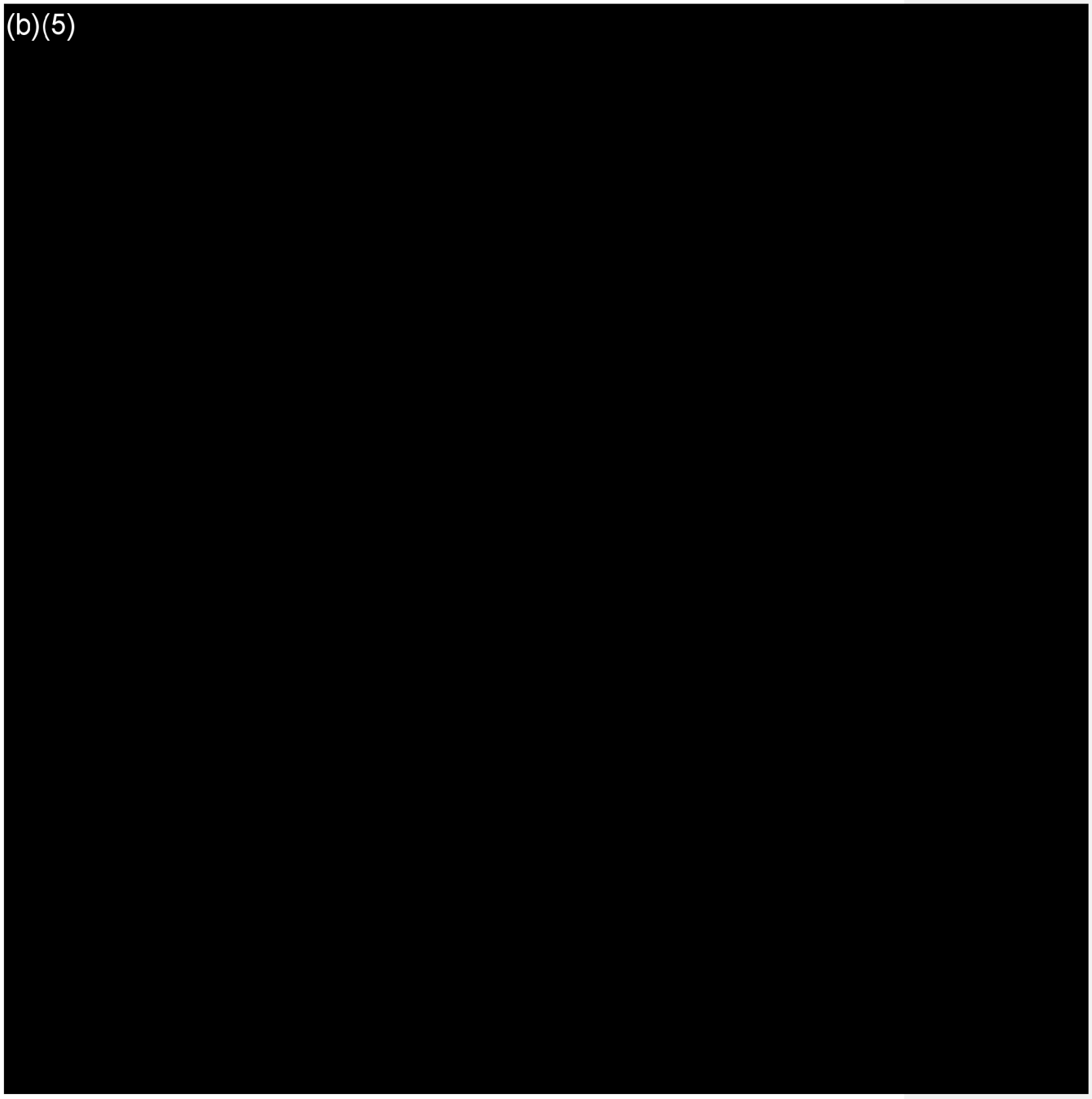
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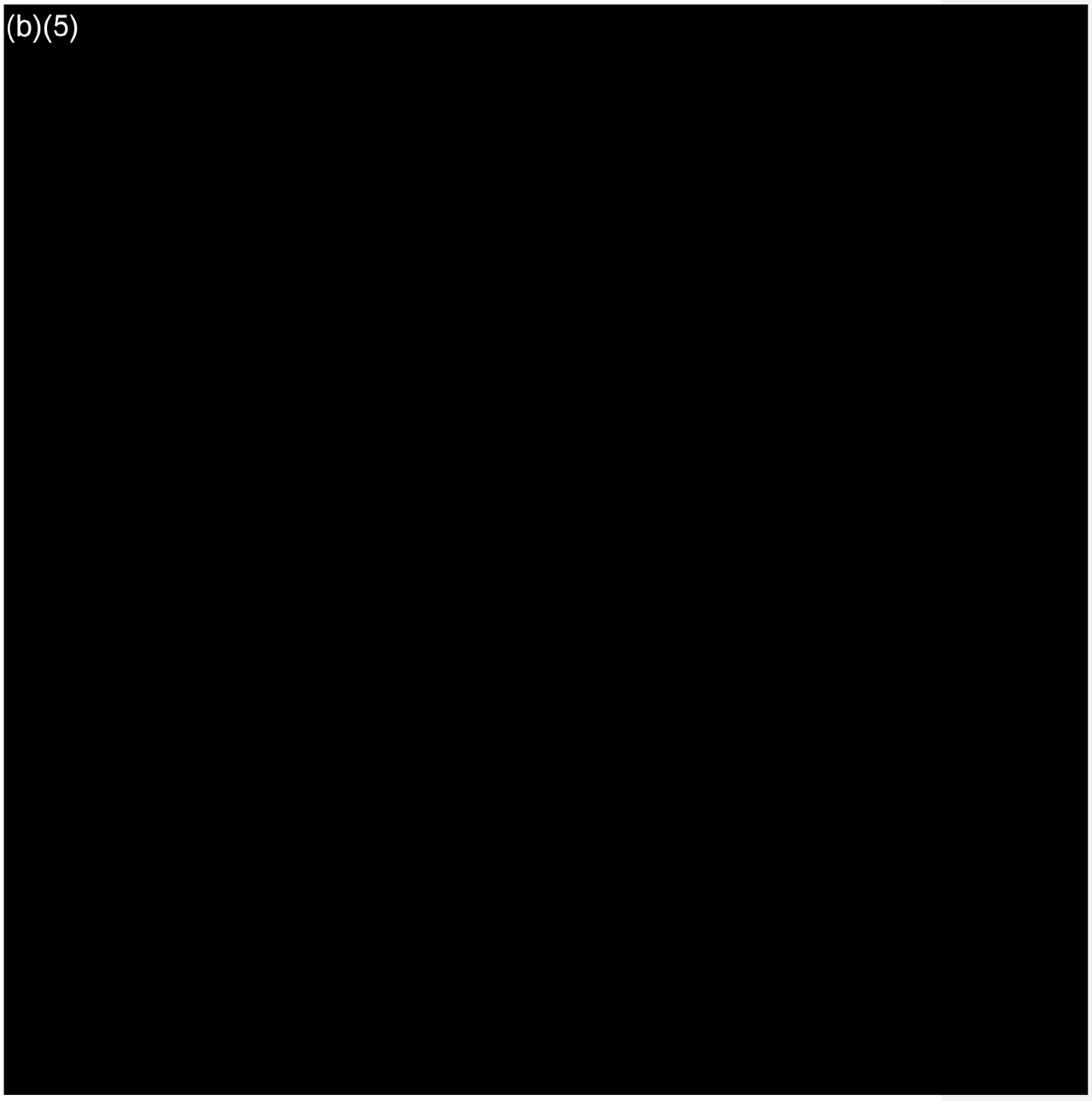

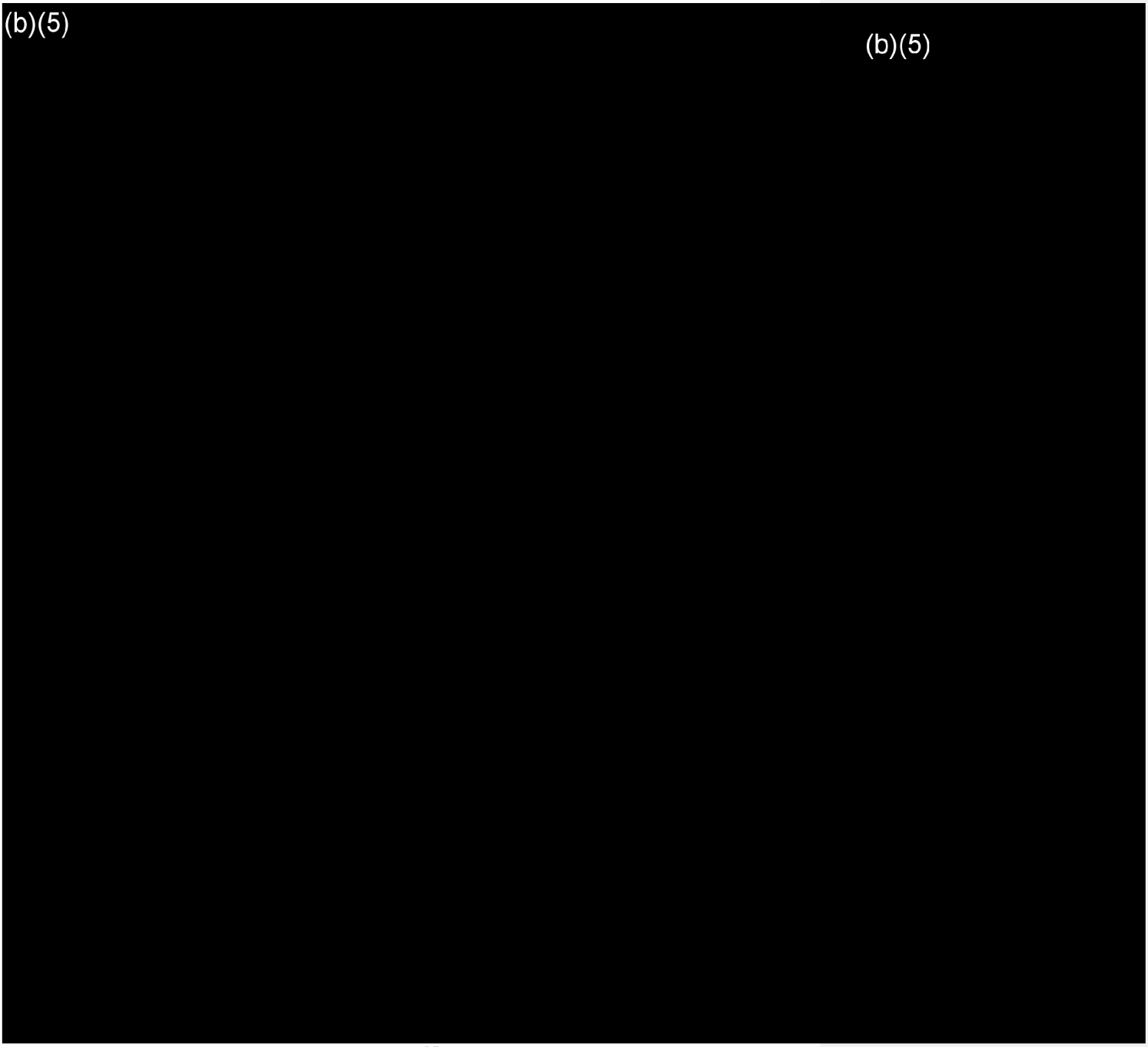

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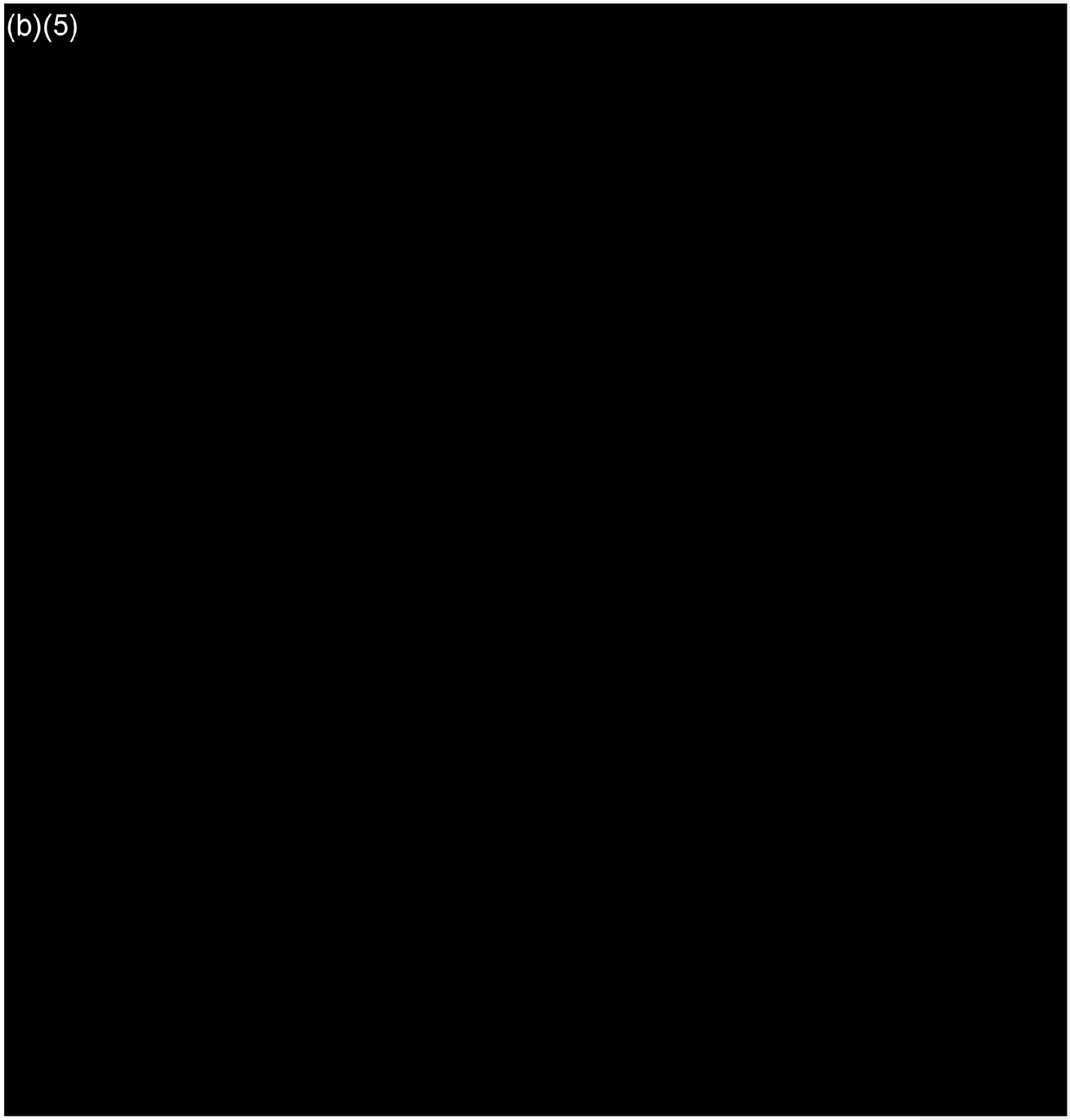
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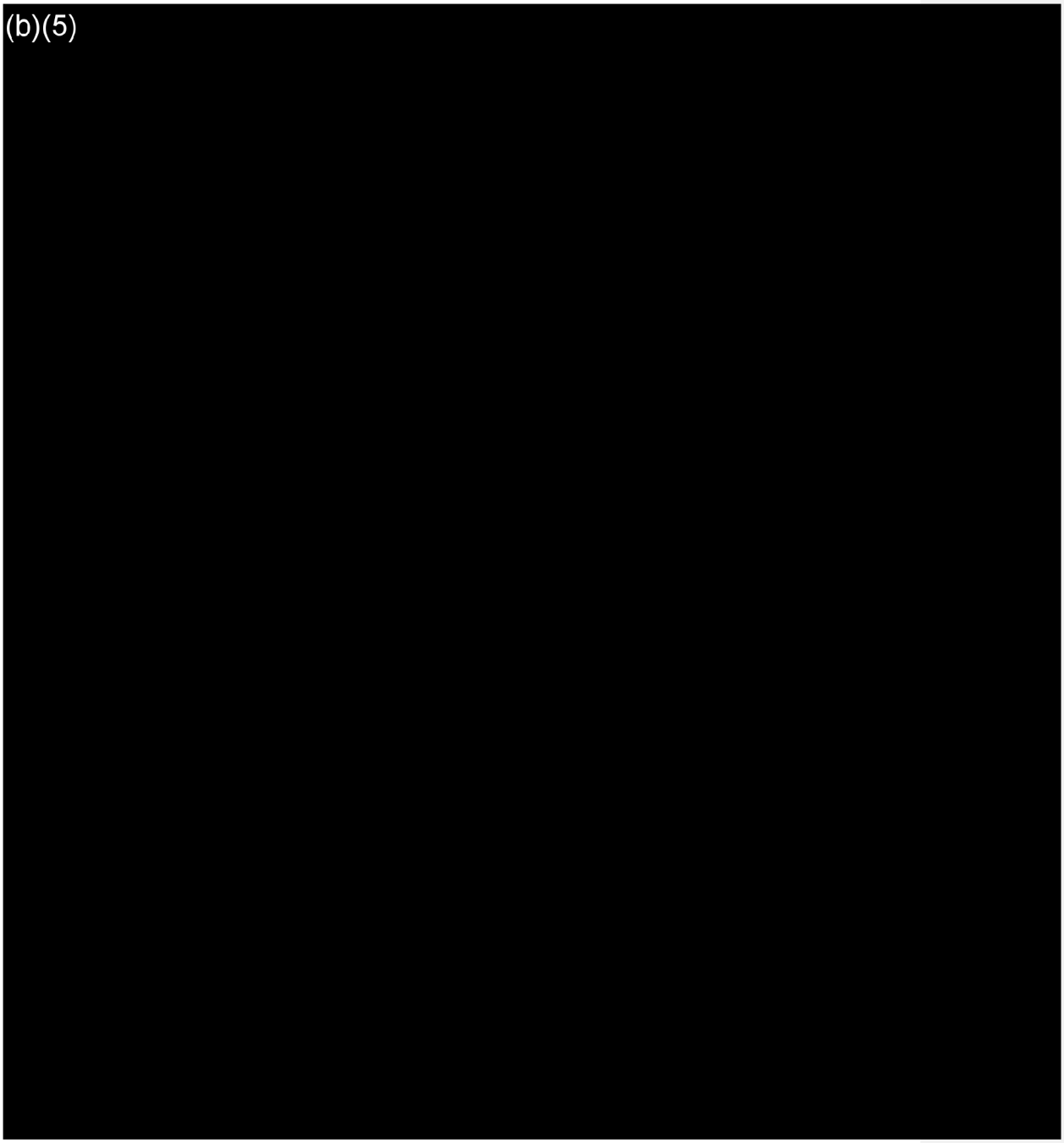
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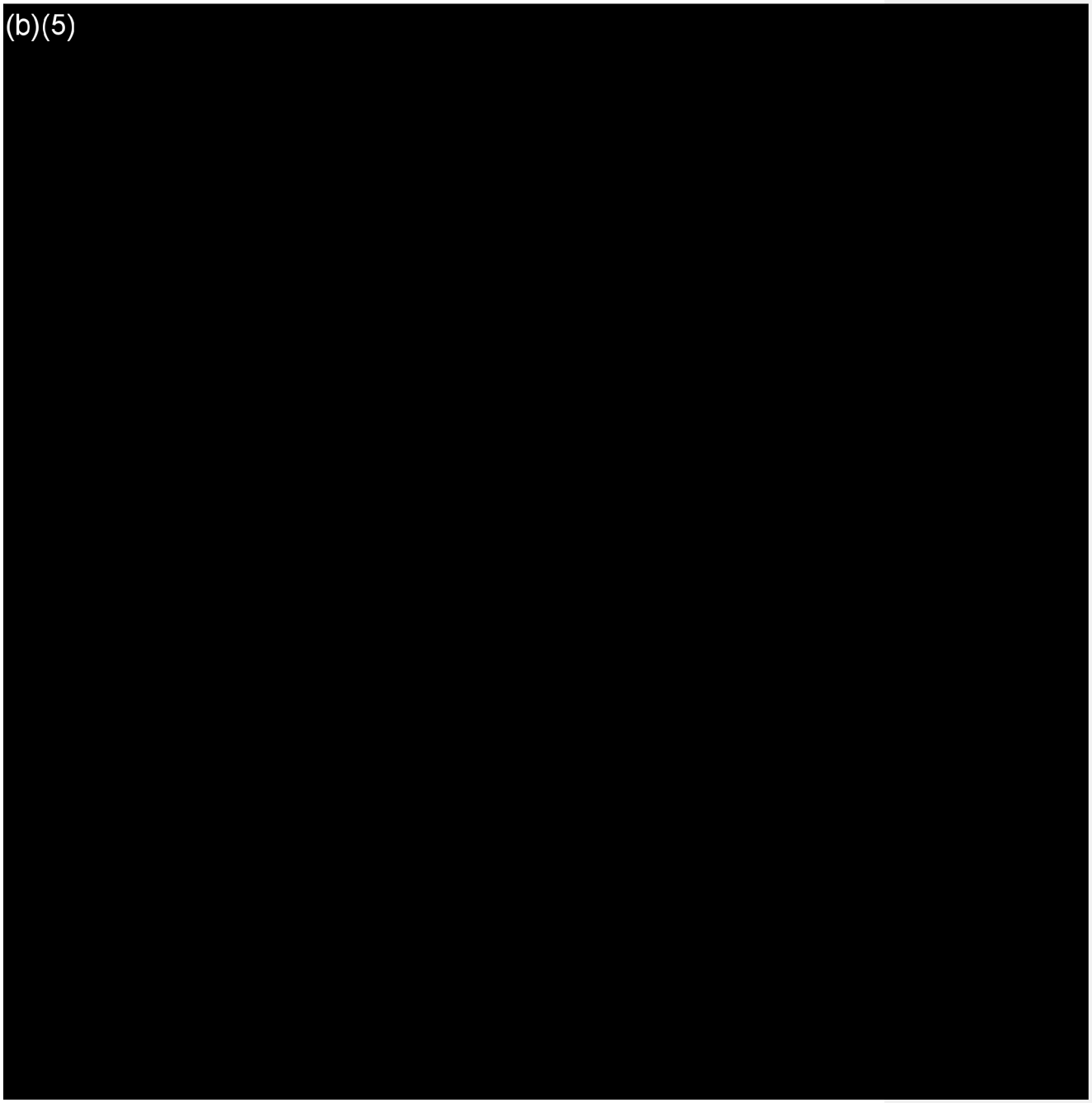
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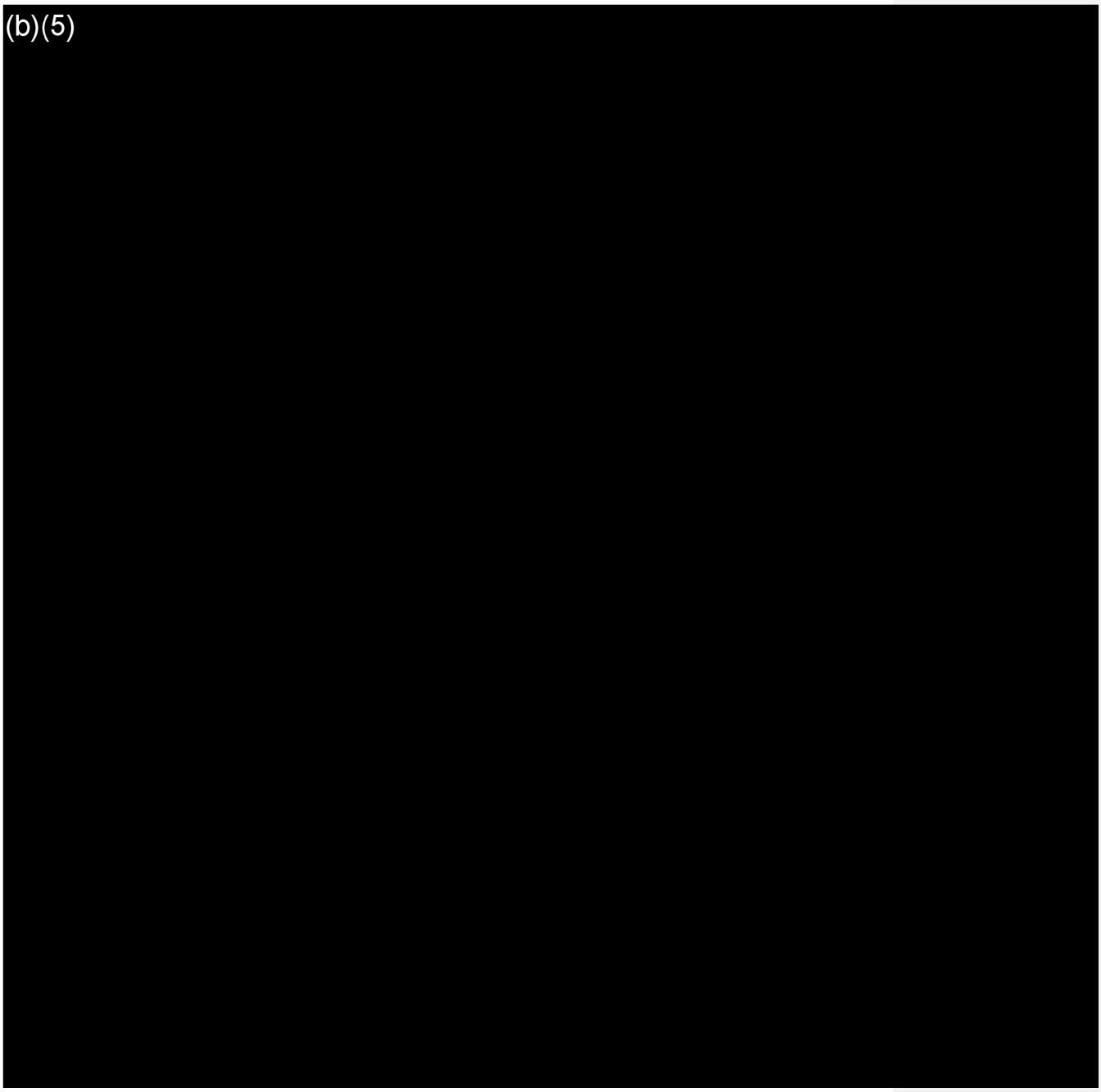
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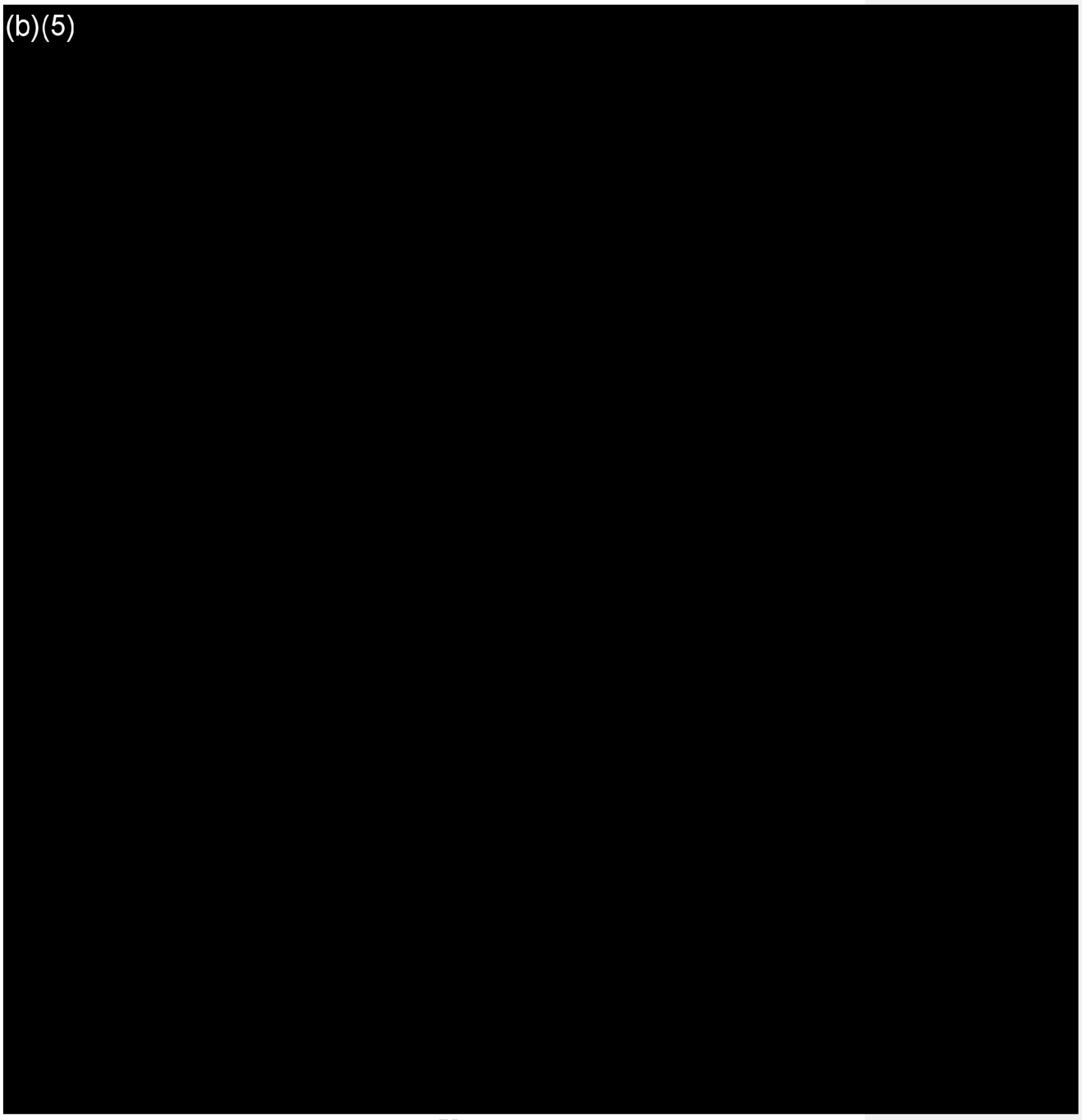

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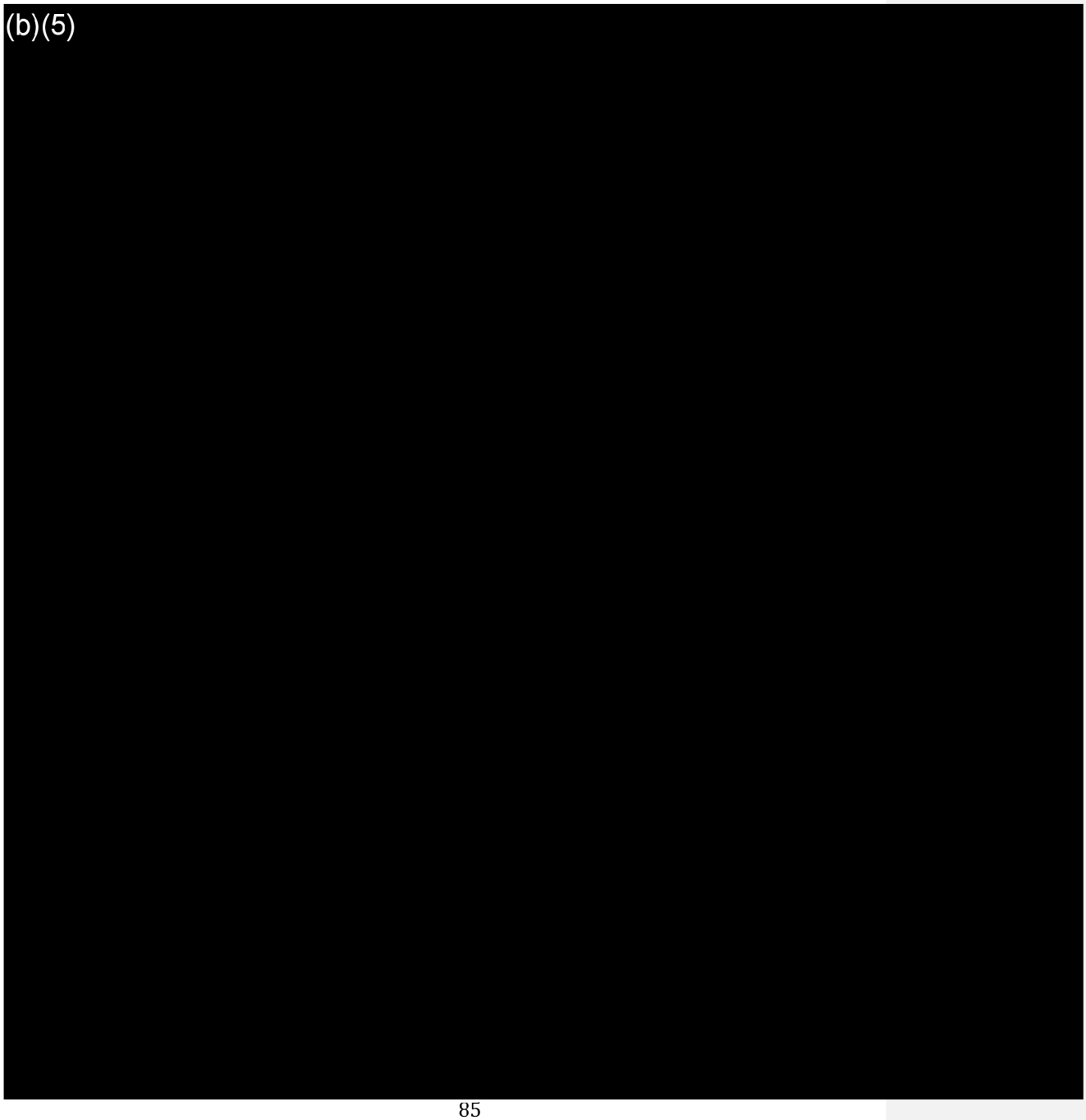
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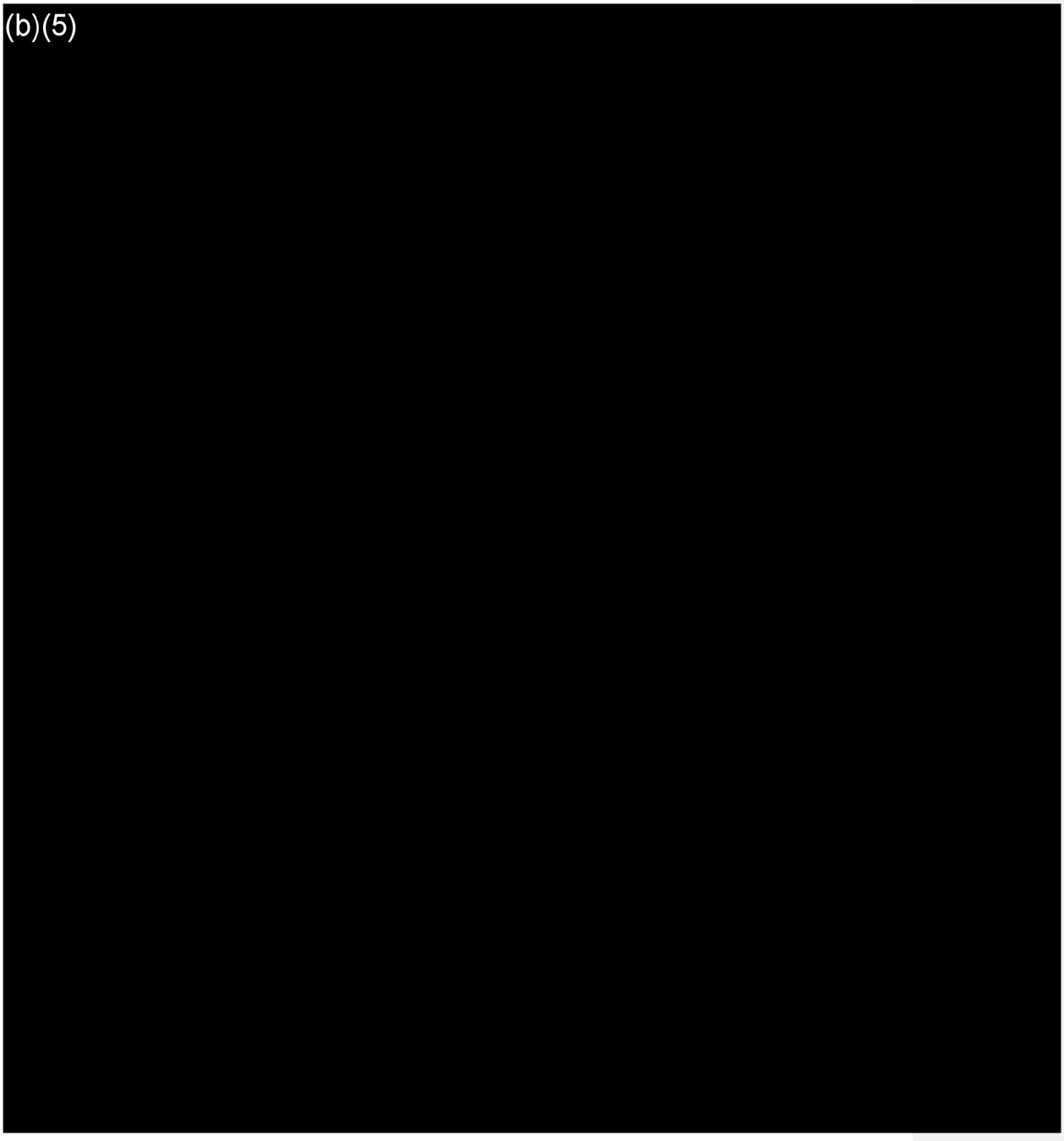
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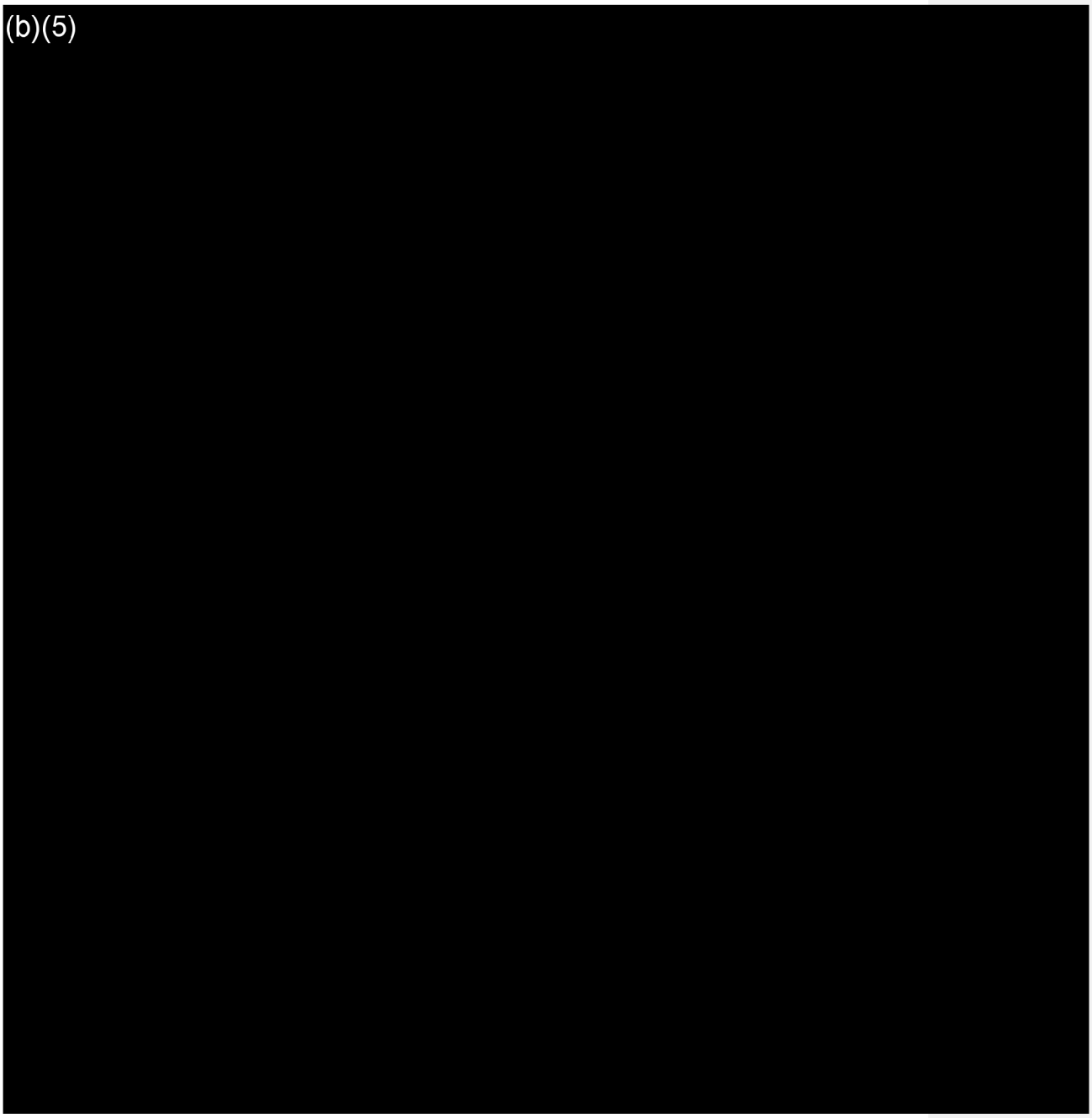

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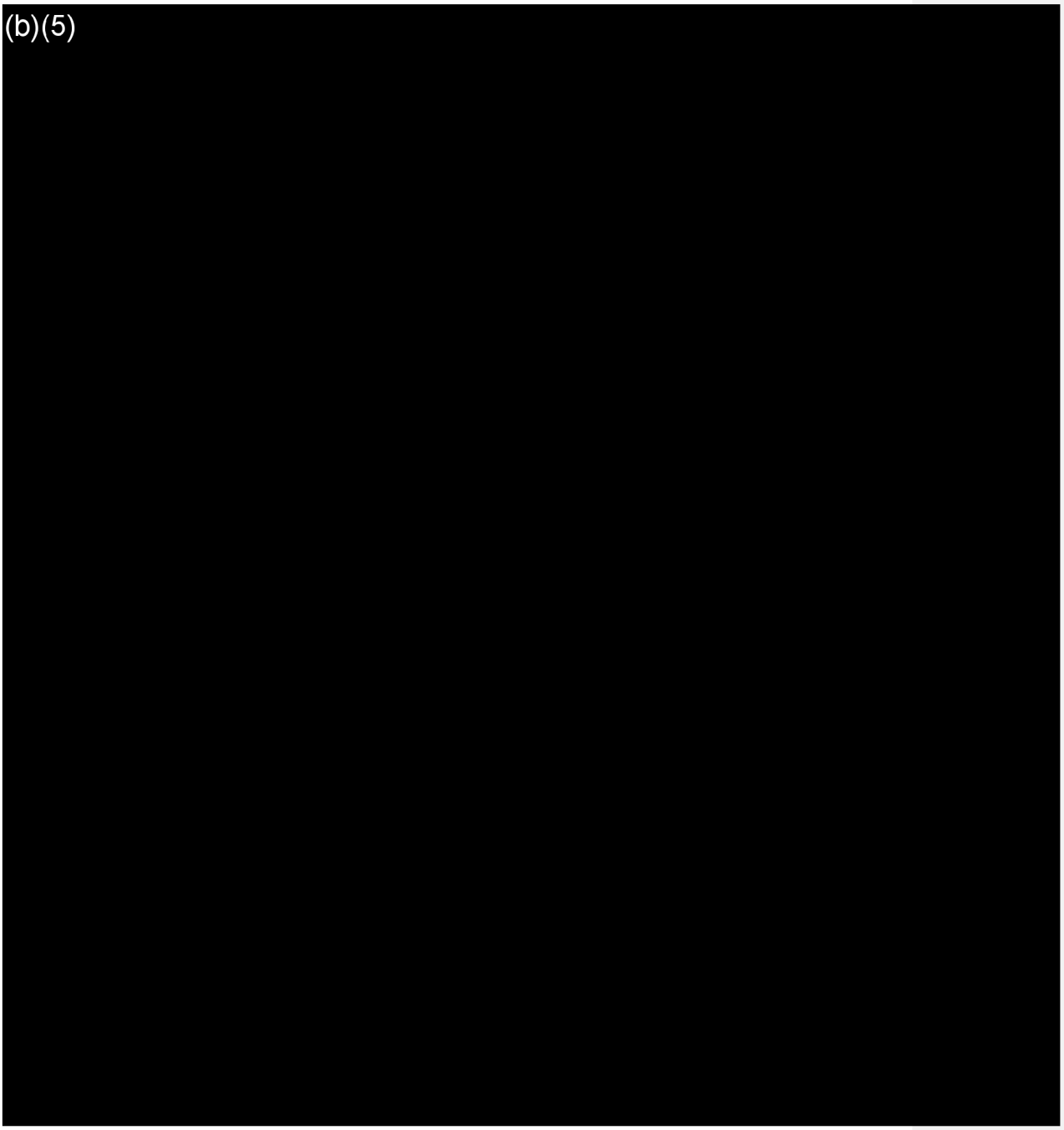

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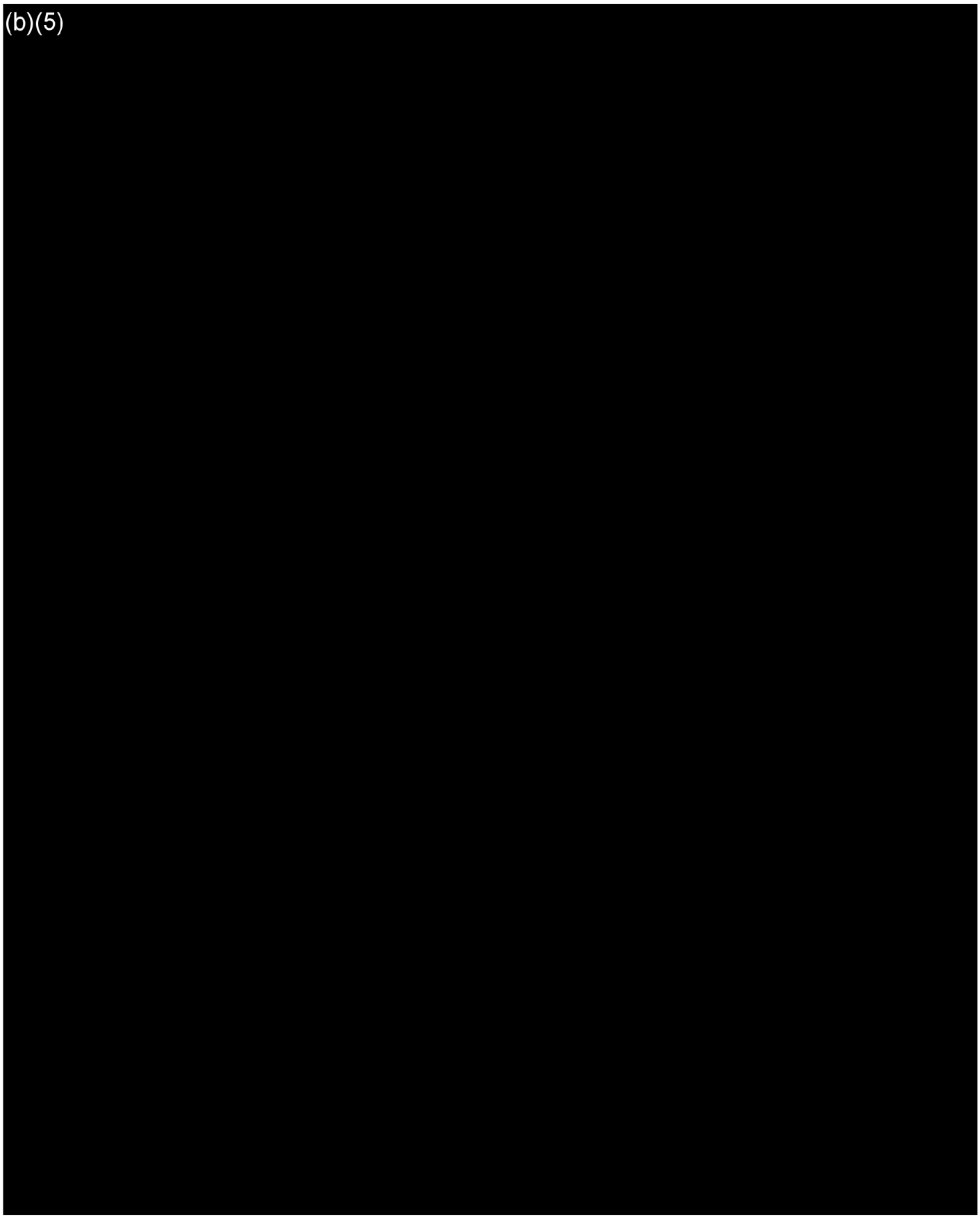
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Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

EXECUTIVE OFFICE

June 20, 2019

In reply refer to: A-7

RE: EIM Participation

To: Bonneville Power Administration's Stakeholders

The Bonneville Power Administration (Bonneville) has formally launched a public process to determine its future role in the Western Energy Imbalance Market (EIM). The first decision will be whether to sign an Implementation Agreement with the California Independent System Operator (CAISO). I am proposing to sign the agreement in September and move toward joining the EIM in March 2022. To support this proposal, Bonneville prepared a "Proposal for Bonneville to Sign an EIM Implementation Agreement," included as Attachment A to this letter.

Participating in an efficient, organized energy market is one action Bonneville could take in its effort to modernize assets and system operations, a key goal of our 2018-2023 Strategic Plan. Through Bonneville's grid modernization initiative, in a coordinated partnership with the U.S. Army Corps of Engineers and Bureau of Reclamation, we are driving efficiencies to support commercial and operational success while maintaining reliability and meeting our obligations to the region.

Signing the Implementation Agreement would not obligate Bonneville to join the EIM, but it is an important milestone, as it establishes a high-level project plan and schedule for the steps we must take to join the market.

To inform this decision, we have been studying how and under what conditions Bonneville could join the EIM. This package describes our findings, much of which has already been shared through previous stakeholder engagements. It includes the results of a cost-benefit analysis, the draft Implementation Agreement, and the principles that must be met before Bonneville will participate in the market. Bonneville has also provided its perspective on the legal implications of joining the EIM, a roadmap of the process for policy decisions needed to get to a final decision, and analysis of several foundational decisions about how Bonneville will participate in the EIM.

To date, all of the participating EIM entities have reported significant generation dispatch benefits, improved situational awareness, and congestion management on their

transmission systems. Bonneville's participation would give power and transmission customers the opportunity to participate in the market with their own generation. Marketers of independent power plants located in the Bonneville balancing authority area would also be eligible to participate in the market.

In 2017, Bonneville staff performed an initial, internal analysis to determine whether there were sufficient benefits for Bonneville to formally explore joining the EIM. Staff's analysis concluded that joining the EIM could provide modest but positive net revenue. Based on this finding, I initiated a formal process to consider whether Bonneville should join the EIM. I directed staff to commission a more exhaustive and precise cost-benefit analysis, consistent with what other utilities have done when considering whether to join the EIM. To perform the cost-benefit analysis, Bonneville contracted with E3, an organization that has performed many similar industry-standard analyses for EIM participants.

The cost-benefit analysis shows Bonneville could earn additional annual power revenues of approximately $29-34 million. There are also significant benefits for transmission reliability and operations due to the improvement in situational awareness, visibility, and congestion management associated with participation in the EIM. This is consistent with the goal of using the transmission system more efficiently.

While the cost-benefit study and other aspects of EIM participation are very encouraging, I realize that joining the EIM has implications for several aspects of Bonneville's operations and business model. There will also be some implications to the services that Bonneville provides its power and transmission customers. That's why we have established a set of principles by which the multiple decisions associated with moving into the market will be measured.

As we approach this significant milestone for Bonneville and the region, I want to emphasize that a well-designed electricity market is built on a strong foundation of resource adequacy, has features that optimize intra-hour energy balancing, and explicitly compensates capacity resources for providing capabilities that are essential for system reliability. While the projected revenues and other benefits of EIM participation are encouraging, the EIM is designed to compensate resources for the real-time energy and ramping capability they provide, which Bonneville views as just one piece of a well-designed electricity market. Additional mechanisms are required to compensate Bonneville for the capacity value of the flexible, carbon-free federal power it chooses to provide.

To complement the EIM, the CAISO should administer a day-ahead product that incents the commitment of additional flexible capability from resources that can be deployed in real-time. I view such a product as an opportunity for Northwest hydro and other dispatchable resources that can quickly ramp up or down to make up for unscheduled changes in load and generation. These valuable capabilities will support the reliability of the western

transmission grid as we work to integrate large amounts of additional renewable energy generation. Bonneville has taken an active role in the CAISO's ongoing effort to develop a day-ahead flexible ramping product. Based on dialogue with CAISO leadership, I expect that the CAISO will complete its stakeholder process and implement this product before Bonneville goes live in the EIM.

We are seeking comments on Bonneville's decision to sign the EIM Implementation Agreement and all other aspects of the attached package. Comments are due by the Close of Business on July 22nd. The attached package includes:

- Proposal for Bonneville to Sign an EIM Implementation Agreement (Attachment A) (includes EIM principles, legal authority, business case, decision-making process and schedule, and certain foundational policy proposals);
- Bonneville Power Administration Energy Imbalance Market Benefits Study, Executive Summary of Initial Results, prepared by E3 (Attachment B); and
- Draft Implementation Agreement (Attachment C).

Bonneville will use the input from comments to develop a record of decision planned for release in September. If the decision is to sign the Implementation Agreement, the next steps will include implementation activities and further stakeholder processes for the additional policy development, leading to needed changes to the Tariff and rates in the TC-22 and BP-22 cases. All this activity will build up to Bonneville making a final decision on whether to join the EIM in late 2021.

In closing, I sincerely appreciate the engagement of our federal partners, the U.S. Army Corps of Engineers and Bureau of Reclamation. I also appreciate stakeholders' participation and thoughtful input in this process. Bonneville is only successful when it moves ideas forward through collaborative and transparent processes where all the voices of its customers and other stakeholders are heard and considered. Joining the EIM would be a big step forward for Bonneville. I see this as an opportunity to move Bonneville into the future and ensure we continue to drive the region's economic prosperity and environmental sustainability. Thank you in advance for your constructive feedback on this important initiative.

Sincerely,

Elliot E. Mainzer
Administrator and Chief Executive Officer

Enclosures (as stated)

Attachment A

Proposal for Bonneville to Sign an EIM Implementation Agreement with the CAISO and Move Forward Toward Joining the EIM

Attachment A

Proposal for Bonneville to Sign an EIM Implementation Agreement with the CAISO and Move Forward Toward Joining the EIM

TABLE OF CONTENTS

I. Background 3

a. Changing Energy Landscape in the Western United States 3

b. Description of the EIM 9

c. Why Bonneville Is Considering Joining the EIM 14

II. Decision-making Framework for EIM Participation 18

III. Proposed Determinations and Policies for Joining the EIM 23

a. Bonneville's EIM Participation Principles 23

1. Participation Is Consistent with Statutory, Regulatory, and Contractual Obligations 24

2. Maintain Reliable Delivery of Power and Transmission to Our Customers 24

3. Resource Participation in the EIM Is and Always Will Be Voluntary 25

4. Bonneville's Decision to Participate in the EIM Will Be Based on a Sound Business Rationale 25

b. Bonneville's Legal Authority to Join the EIM 26

1. Joining the EIM Is an Exercise of Bonneville's Authority to Operate in a Business-Like Manner 27

2. Joining the EIM Is Consistent with Preference and Surplus Requirements 28

3. Bonneville's Decision to Bid Generation into the EIM Is Consistent with Its Obligation to Make Sales from the Federal System 31

4. Joining the EIM Is Consistent with Bonneville's Statutory Authority to Provide Transmission Service 34

5. Joining the EIM Is Consistent with Bonneville's Contractual Commitments 36

6. FERC Jurisdiction with Respect to Bonneville as an EIM Entity 38

7. Market Oversight Under the CAISO Tariff 39

8. EIM Governance 43

c. Environmental Obligations 45

d. Business Case for Joining the EIM 46

1. Background and Context 46

BPA-2020-00784-F 0015

2. Costs and Benefits Analysis Summary 47
i. Costs of Joining the EIM 47
ii. Benefits of Joining the EIM 49
iii. Net Benefit of Joining the EIM 52
iv. Transmission Benefits 53
e. EIM Policy Proposals 59
1. Federal Generation Participation Plan 59
2. Transmission Usage – Interchange 64
3. System Operations Tools 67
4. Carbon Obligations and Related Matters 69
5. Market Power (LMPM and DEB) 74
6. Load Aggregation 77
7. Resource Sufficiency – Balancing Authority Area Level 78
IV. EIM Implementation Agreement 80
a. Background 80
b. Bonneville's Implementation Agreement with the CAISO 81
c. Bonneville-Specific Language in the Implementation Agreement 82
V. Remaining Policy Decisions Planned for Phase III 84
a. Transmission Usage Network 85
b. Allocation of EIM Charge Codes 85
c. Resource Sufficiency – Sub Balancing Authority Area level 86
d. Transmission Losses 86
e. Non-federal Resource Participation Requirements 86
f. Settlements/Billing (Mechanics) 87
g. Data Submission Requirements 87
h. Metering Requirements 87
VI. Conclusion 88

BPA-2020-00784-F 0015

I. Background

The Bonneville Power Administration (Bonneville) is considering whether to sign an Implementation Agreement, which is a necessary first step to join the California Independent System Operator's (CAISO) Western Energy Imbalance Market (EIM). As part of its decision, Bonneville has prepared this Letter and Policy Proposal document (Proposal) to describe the legal, business, operational, and policy considerations associated with joining the EIM. This Proposal is the culmination of Bonneville's initial findings on these matters. The majority of the content set forth in this Proposal has previously been discussed with stakeholders through monthly public meetings that Bonneville began in July 2018.[1]

As explained in the Administrator's cover letter, the decision to sign the Implementation Agreement will signal Bonneville's intent to join the EIM as long as certain principles are met during implementation and the remaining policy issues are resolved prior to beginning financially binding transactions in the market (go-live) in 2022. The decision to sign the Implementation Agreement is the first of several decisions that need to be made before Bonneville could begin market participation.

The remaining portion of this section describes: (1) the changing energy landscape in the Western United States; (2) what the EIM is and how it operates; and (3) why Bonneville is interested in EIM participation.

a. Changing Energy Landscape in the Western United States

Changes in the Energy Industry

The energy industry is experiencing fundamental changes in structure that continues to directly impact Bonneville's operations and commercial value. These industry-wide changes are driven by the significant expansion of variable energy resources (VERs) output, as well as the need to maximize the utilization of existing transmission capacity prior to embarking on expensive and time-consuming transmission expansion efforts. VERs are getting cheaper to build and operate.[2] Regional public policy makers and end-use consumers are also demanding a cleaner mix of energy resources.[3] Since 2010, generation

[1] For more information on Bonneville's public stakeholder process and materials, please see https://www.bpa.gov/Projects/Initiatives/EIM/Pages/Energy-Imbalance-Market.aspx.
[2] *See* 2018 Annual Technology Baseline, National Renewable Energy Laboratory, *available at* https://atb.nrel.gov/electricity/2018/index.html?t=in.
[3] Washington, Oregon, and California have all passed or are considering legislation to implement zero-carbon.

BPA-2020-00784-F 0015

output from variable energy resources in the West has grown by 150% while generation output from other resource types has been flat or declining.[4]

Long-line transmission is expensive to build, operate, and maintain, and moreover, many people do not want transmission lines in their backyards. In 2017, Bonneville decided to defer its own transmission build option through the South of Allston transmission constraint.[5] This was due in part to costs, local opposition, and the emergence of non-wires options—including the possibility of joining the EIM—that were proving effective at reducing flows through the South of Allston and were helping Bonneville address transmission service requests on that path.[6] While the EIM helps maximize the use of the existing transmission system, additional transmission reinforcements will likely be needed in the future.

For decades, these high-level trends have worked together in other parts of the U.S. to stimulate the adoption and expansion of organized markets. Regional Transmission Organizations (RTOs) are able to increase generation in some areas and simultaneously decrease generation in others—known as re-dispatch—across a broad market footprint to maximize the use of the existing transmission grid, alleviating pressure to build new transmission lines. The same re-dispatch of generation can also reliably and efficiently ease the integration of variable energy resources.

The uncertainty of wind and clouds—which cause VERs to vary moment-to-moment and throughout the day—can be matched with the near instantaneous demand from load by calling on the least cost generator(s) in a larger, diverse geographic area that have the available generation capability to ramp up or down. However, with the exception of the California Independent System Operator (CAISO), the Western U.S. had not been able to formulate a viable region-wide organized market until November 2014, when PacifiCorp and the CAISO initiated the Energy Imbalance Market.

Until that time, the rest of the West had utilized bilateral markets to buy and sell electricity. As zero variable cost energy supply from VERs has increased in the CAISO's organized

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[4] Short-Term Energy Outlook, DOE (May 2019), *available at* http://www.eia.gov/outlooks/steo/.

[5] See, *e.g.*, Bonneville's decision not to build the I-5 Corridor Reinforcement Project, citing the size, local impacts, and increasing costs as reasons to not build the proposed project. Bonneville Power Admin., I-5 Corridor Reinforcement Project Decision Letter (May 17, 2017), *available at* https://www.bpa.gov/Projects/Projects/I-5/Documents/letter_I-5_decision_final_web.pdf.

[6] Bonneville's Non-Wires SOA Pilot Summary Results, slide 4 (Dec. 10, 2018), *available at* https://www.bpa.gov/transmission/CustomerInvolvement/Non-Wire-SOA/Pages/Meetings.aspx. "BPA acquired two years of incremental and decremental capacity and energy (deployed with day-ahead notice) to reduce flows on SOA flowgate during summer peak periods. . . . Non-wires portfolio balances 200 MW of incremental capacity with 200 MW of decremental capacity to provide counter flow." *Id.*

markets, downward pressure has been exerted on energy prices inside the CAISO and this has extended into bilateral markets in the West. At the same time, natural gas prices have fallen as increasingly efficient extraction techniques have emerged. This too has driven electricity prices lower. On the other hand, the need for capability produced by generation resources that are carbon free and flexible has been growing. Bonneville markets federal hydroelectric power (energy and capacity) and anticipates demand for this capacity will continue to increase in the West.

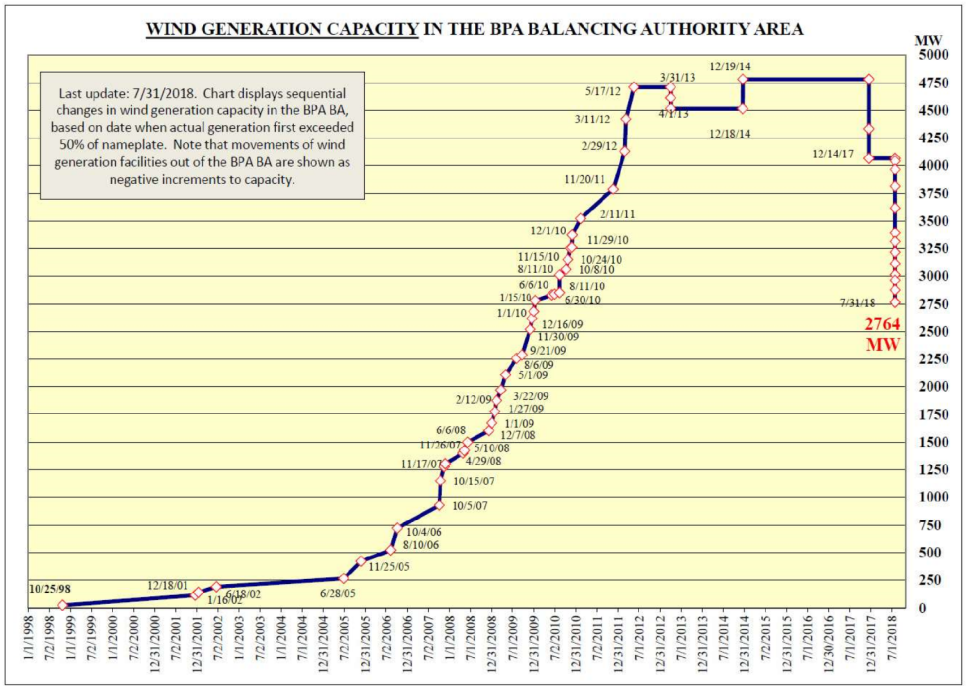
The Effect of the Changing Energy Landscape on Bonneville

Bonneville has been navigating these industry-wide changes. Bonneville has increased sales of long-term firm transmission in the past 10 years, allowing Bonneville to operationally integrate the most diverse set of generating resources into the Federal Columbia River Transmission System (FCRTS) in the history of Bonneville. This is in large part due to thousands of megawatts of renewable generators interconnecting to the FCRTS and purchasing transmission and ancillary services from Bonneville.

On the generation side, Bonneville has enhanced our positioning of the FCRPS to significantly increase its capability to make available the flexible, clean hydropower generation for more granular dispatches to support the variability of VERs. This has resulted in Bonneville selling generation integration services to variable energy resources that help to reliably transmit their variable generation output to loads. However, revenue from generation integration services is now declining as VERs exit the Bonneville balancing authority area in search of lower cost services from non-Bonneville sources.[7]

[7] PacifiCorp, Portland General Electric, Puget Sound Energy, and Avangrid have each electrically removed their variable energy resources from Bonneville's balancing authority area and added them into their own balancing authority areas, thus reducing the amount that they pay to Bonneville for integration services, while continuing to pay Bonneville for transmission service.

BPA-2020-00784-F 0015

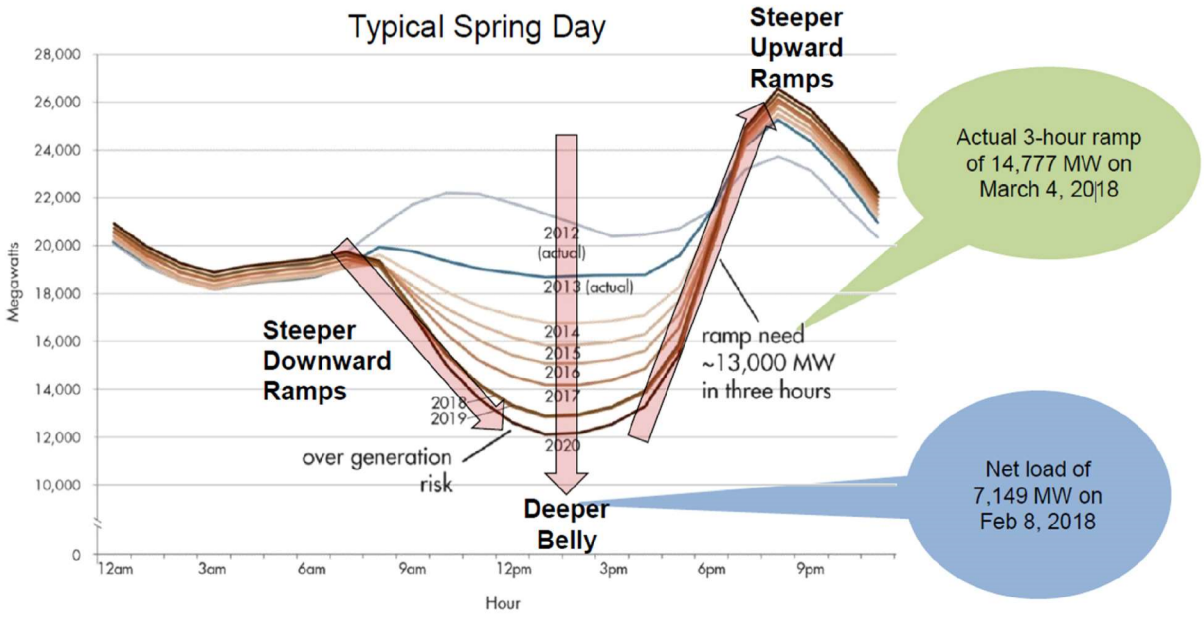


The above graphic illustrates how wind resources in particular were rapidly interconnecting into the Bonneville balancing authority area until 2012 and then subsequently exited in large numbers in 2017 and 2018. While those resources continue to take transmission service from Bonneville, they are now choosing to leave the Bonneville balancing authority area for other opportunities, including the possibility of participating in markets like the EIM.

Bonneville often has more energy supply than it needs to meet preference customer load. Therefore, in most years, Bonneville is a net seller of electricity into bilateral markets. But these markets are now experiencing abundant supplies of VERs generation and generation from low-priced natural gas. As a result, the revenues that Bonneville receives from its surplus sales have been declining. These dynamics—reduced capacity and energy revenues—have exerted upward pressure on Bonneville's power rates, affecting Bonneville's competitiveness in the region.

The CAISO's Response to the Changing Energy Landscape

Similarly, California has experienced significant expansion in VERs, pressure not to build long-line transmission, and low natural gas prices. Arguably, the CAISO's experience with some of these trends is even more pronounced than any other portion of the West.



Since 2012, the CAISO has published this "duck curve."[8] This graphic illustrates how significantly and quickly the expansion of output from VERs, particularly solar, has altered the traditional diurnal nature of its daily load curve. Now the CAISO's net load curve—load minus VER output—is oversupplied in the mid-day hours. These were traditionally the high load hours, and were therefore highly valued on-peak hours for energy sales. This "duck curve" also displays very pronounced morning and evening ramps in the spring that push the CAISO market and its operators to incent more flexible generators to be available in these hours to stabilize the grid as the sun rises and sets. Not only do marginal clearing prices for energy in organized markets like the CAISO contribute to solving this, but the CAISO has also pioneered its real-time Flexible Ramping Product in 2016. This product further compensates generators in its real-time market for the opportunity cost of producing—or not producing—energy in a current market interval so that the same generator can be available to ramp up or down when its ramp capability is needed in a future interval.[9] In other words, Participating Resources[10] are compensated for pre-positioning to generate when needed most.

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[8] Energy Storage and Distributed Energy Resource Phase 4 Issue Paper, CAISO Stakeholder Workshop, CAISO, at 38 (Mar. 18, 2019), *available at* http://www.caiso.com/Documents/Presentation-Energy-Storage-DistributedEnergyResourcesPhase4-Mar18-2019.pdf.

[9] Market Notice: Flexible Ramping Product Deployed and Activated, CAISO (Nov. 1, 2016), *available at* http://www.caiso.com/Documents/FRP-RSI_CPM_CCE2Deployed-Activated.html.

[10] *See* CAISO Tariff § 29.4(d), *available at* http://www.caiso.com/Documents/ConformedTariff-asof-Apr1-2019.pdf. Participating Resources in the EIM must sign a Participating Resource Agreement with the CAISO, submit hourly bids and base schedules to the CAISO, and settle directly with the CAISO.

BPA-2020-00784-F 0015

This chart also shows that additional flexible resources will be necessary to address these morning and evening ramps. To this end, the CAISO's efforts to develop a day-ahead product(s) that incents the commitment to pre-position additional flexible capability from resources in the day-ahead that can be deployed in real-time will help address these ramping challenges. This product(s) would be an opportunity for Bonneville and other Northwest hydro, as well as other dispatchable resources that can quickly ramp up or down to make up for unscheduled changes in load and generation.

Similar to Bonneville, the CAISO has not approved any new long-line transmission recently.[11] This contributes to increasing amounts and duration of transmission congestion inside the CAISO market that can cause locational prices to decrease in some areas and rise in other areas of the CAISO balancing authority area.[12]

California has also experienced low natural gas prices since 2014.[13] This has contributed to low market clearing prices in many intervals, which cause existing and prospective owners of traditional dispatchable resources to not earn enough revenue to recover their capital costs.[14]

The EIM extends the CAISO's access to participating generators outside of its balancing authority area to help it to more efficiently manage the oversupply and daily ramps created by VERs. The CAISO has avoided 810,116 megawatt hours of renewable curtailments

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[11] The 2018-2019 ISO Transmission Plan provided an update on the ongoing transmission projects that were previously approved by the CAISO Board of Governors, as well as approvals for new projects this year. There were no new long line 500kV transmission project approvals greater than 60 miles in length and approximating the $750 million cost of Bonneville's project formerly known as the I-5 Corridor Reinforcement Project. Among previously approved projects costing $50 million or more (see Table 8.1-2) in the 2018-2019 Transmission Plan), there are only two transmission projects that Bonneville might consider to be similarly capital intensive "long line" projects. These are the approximately 60-mile Harry Allen (a substation owned by NV Energy) to Eldorado (a substation owned by Southern California Edison (SCE)) 500kV transmission line project approved in 2014 that is expected to be in-service in 2020 and the 114 mile Delaney (a substation owned by Arizona Public Service) to Colorado River (a substation owned by SCE) 500kV transmission line project that was also approved in 2014 with an expected in-service date in 2021. 2018-2019 Transmission Plan, California Independent System Operator, Mar. 29, 2019, at 469-82, *available at* http://www.caiso.com/Documents/ISO_BoardApproved-2018-2019_Transmission_Plan.pdf; 2013-2014 ISO Transmission Plan, CAISO, at 277-95 (July 16, 2014), *available at* http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan_July162014.pdf; 2013-2014 ISO Transmission Plan, ISO 2013-2014 Transmission Planning Process Supplemental Assessment: Harry Allen-Eldorado 500 kV Transmission Project Economic Need, CAISO, at 2 (Dec. 15, 2014), *available at* http://www.caiso.com/Documents/HarryAllen-EldoradoProjectAnalysisReport_AppendixA.pdf.

[12] *See* 2018 Annual Report on Market Issues and Performance, CAISO DMM, at 11 (May 2019), *available at* http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf.

[13] *See id.* at 3-4.

[14] *See id.* at 15-17.

BPA-2020-00784-F 0015

because of the EIM.[15] The amount and shape of EIM energy transactions has also deflected some of the pressure from transmission congestion and thermal resource retirements in California, while providing operational enhancements and spreading more than $650 million of gross benefits among all EIM participants.[16]

b. Description of the EIM

In assessing whether Bonneville should join the EIM, it is important to understand the mechanics of how the EIM operates.

Overview

The EIM[17] is an intra-hour (or real-time) centralized energy market used to economically dispatch participating generation resources to balance supply, transfers between balancing authority areas (interchange), and load across the market's footprint. It does so while simultaneously ensuring generation and transmission limitations are respected. For balancing authorities in the EIM (EIM Entities), the EIM replaces the provision of imbalance under sections 4 (energy imbalance) and 9 (generator imbalance) provided under the EIM Entities' respective Open Access Transmission Tariffs (Tariff). In joining the market, EIM Entities revise the imbalance service provisions of their respective Tariffs.

The EIM utilizes bids from voluntarily offered Participating Resources to come up with the most economical and reliable dispatch of generation to meet load and interchange demands. One of the primary benefits of the EIM is that it leverages the geographical diversity of resources and loads across the entire EIM footprint, which is much larger and more diverse than any single balancing authority area.

The EIM is comprised of a 15-minute market (FMM) and a 5-minute real time dispatch (RTD). This means the market clears every 15 minutes for the FMM (four intervals each hour) and every 5 minutes for the RTD (12 intervals each hour).

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[15] Western EIM Benefits Report, First Quarter 2019, CAISO, at 15 (Apr. 29, 2019), *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx. "If not for energy transfers facilitated by the EIM, some VERs located within the ISO would have been curtailed via either economic or exceptional dispatch. The total avoided renewable curtailment volume in MWh for Q1 2019 was calculated to be 8,216 MWh (January) + 6,243 MWh (February) + 37,795 MWh (March) = 52,254 MWh total." *Id.* at 14.

[16] *Id.* at 3.

[17] For more detailed information on the EIM, please see Bonneville's "EIM 101" presentation, dated September 13, 2018, *available at* https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20180913-September-13-2018-EIM-101-Workshop.pdf, or viewed by video at https://www.youtube.com/watch?v=ChYJRXEIADk.

EIM-Related Agreements and Relationships

When a balancing authority area joins the EIM, it becomes an EIM Entity. Prior to becoming an EIM Entity, the balancing authority must sign an Implementation Agreement that commits the balancing authority and the CAISO to work together on implementing the necessary systems and processes so that the CAISO can operate the EIM in the balancing authority area.[18] An Implementation Agreement terminates once EIM transactions in the EIM Entity's balancing authority area become financially binding.

Before beginning financial transactions in the EIM, the balancing authority and the CAISO will sign an EIM Entity agreement, which is an enabling agreement that allows the CAISO to operate the EIM in the balancing authority area. The EIM Entity agreement requires an EIM Entity to abide by the terms and conditions of the CAISO's Tariff applicable to the EIM.

Generation resources in an EIM Entity's balancing authority area can be either a Participating Resource or a Non-participating Resource. A Participating Resource elects to voluntarily participate (or bid) into the EIM. In order to become a Participating Resource, the entity marketing the output of the resource must sign a Participating Resource agreement with the CAISO, which is an enabling agreement that requires the marketer of the Participating Resource to abide by the terms and conditions of the CAISO's Tariff applicable to the EIM. A Non-participating Resource is a resource within the EIM Entity balancing authority area that elects not to participate in the EIM and does not have a direct relationship with the CAISO.

EIM Entities and marketers of Participating Resources must designate a Scheduling Coordinator to submit EIM schedules to the CAISO and receive settlement invoices from the CAISO. The roles and responsibilities of each type of coordinator are memorialized in an EIM Entity Scheduling Coordinator agreement or Participating Resource Scheduling Coordinator agreement.[19] The CAISO does not settle directly with Non-participating Resources or individual load serving entities within an EIM Entity's balancing authority area.

[18] See section IV below for a detailed discussion on the specifics of Bonneville's draft Implementation Agreement, which is attachment C.

[19] For more information on the various agreements the CAISO requires and the process for joining the EIM, please see slides 11-18 of the November 14, 2018, public EIM stakeholder presentation at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181113-Nov-14-2018-EIM-Stakeholder-Mtg.pdf.

Resource Participation

Resource participation in the EIM is voluntary both in terms of whether to become a Participating Resource and whether to participate in any given hour. Moreover, as described in further detail below, marketers of multiple Participating Resources can choose to aggregate resources when certain parameters are met, or even choose to designate certain portions of aggregated resources as participating and non-participating.[20] Participating Resources submit incremental and/or decremental bid ranges with specified price curves to the CAISO for every hour, and the CAISO will provide dispatch instructions to the Participating Resource's Scheduling Coordinator if the market run determines that the Participating Resource should move within the parameters of the bid range.[21]

Transmission

The EIM utilizes transmission made available to facilitate the dynamic transfers of energy between EIM Entities' balancing authority areas that may result from the market optimization. The CAISO honors physical transmission constraints within each EIM Entity's balancing authority area while running the market. The lack of transmission for EIM transfers may result in a less economical dispatch and higher prices for energy.

Transmission is provided in the EIM consistent with non-discriminatory open access principles. Currently, there is no explicit charge for transmission usage in the EIM. EIM Entities provide or allow transmission for EIM transfers in one of two ways. First, an EIM Entity can directly provide unused transmission for EIM transfers at no charge. Second, an EIM Entity may allow transmission customers to donate their transmission rights and allow that transmission to be used for EIM transfers.[22]

Market Operation & Timelines

For the EIM to operate smoothly, it has a series of hourly timelines that the EIM Entity, Participating Resources, and the CAISO must follow.[23] In general terms, the timeframes dictate when EIM Entities and Participating Resources must submit initial and revised base schedules and bid curves for Participating Resources, which the CAISO will use in its

[20] See section III.e.1 for more information on how Bonneville is proposing to aggregate federal resources for participation in the EIM.
[21] Section III.e.1 describes how Bonneville plans to participate with federal resources in the EIM. Non-federal resource participation is discussed in section V.e.
[22] See section III.e.2 for more information on Bonneville's proposal regarding transmission donation.
[23] Bonneville conducted an "EIM 101" presentation for stakeholders on September 13, 2018, where the EIM market timelines were discussed in detail. The presentation and video can be accessed at the links provided in footnote 17, above.

BPA-2020-00784-F 0015

market dispatches and settlement statements. The hourly timeframes also dictate when the CAISO must run and publish the results of its resource sufficiency evaluation to ensure that EIM Entities make available sufficient resources, transmission, and flexible capacity in their respective balancing authority areas to be allowed to participate in the EIM and not lean on resources in other balancing authority areas. The timelines also dictate when the CAISO must issue dispatch instructions and orders to the 15-minute and 5-minute real-time dispatch markets.

The CAISO uses the base schedules and bid range provided by EIM Entities and Participating Resources to calculate the most economic dispatch based on available transmission, transmission congestion, and losses. This dispatch results in Locational Marginal Prices (LMPs) and Dispatch Operating Targets (DOTs) for Participating Resources, occurring every 15 and 5 minutes. The CAISO also updates dynamic schedules to facilitate the optimal transfers of energy between EIM Entities.

Base schedules submitted by EIM Entities and Participating Resources become financially binding within the hour, and the CAISO uses them to generate settlements statements. Separate settlement statements are issued to the EIM Entity Scheduling Coordinator and Participating Resource Scheduling Coordinator.

EIM Settlements

The EIM is financially settled through the settlement system administered by the CAISO. Each week, the CAISO issues settlement statements to the Scheduling Coordinators for EIM Entities and Participating Resources containing their respective shares of the costs or payments associated with the EIM. The CAISO's settlement system allocates costs and payments to EIM Entities and Participating Resources in accordance with a series of charge codes that are described in detail in the CAISO's Tariff, Business Practice Manuals, and Configuration Guidelines.

While the CAISO issues settlement statements to the Scheduling Coordinators for EIM Entities and Participating Resources, it does not dictate how EIM Entities sub-allocate the benefits and costs of EIM participation to their customers. Rather, EIM Entities are responsible for developing the appropriate Tariff provisions and business practices describing and implementing the sub-allocation of EIM-related benefits and costs.[24]

[24] See section V.b below for Bonneville's proposed process for developing policies regarding the sub-allocation of EIM-related benefits and costs.

BPA-2020-00784-F 0015

EIM Governance

The EIM is governed by two decisional bodies: the CAISO Board of Governors and the EIM Governing Body.[25] The scope of each body's authority depends on whether the matter is EIM-specific or broadly applicable to all CAISO market participants. The members of the CAISO Board of Governors are appointed by the Governor of California and meet the independence criteria for organized markets promulgated by FERC.[26] The EIM Governing Body consists of five members that act independently of market participants and stakeholders.[27]

In particular, the EIM Governing Body has authority to approve all issues that fall entirely within its "primary" authority, *i.e.*, EIM-specific rules that apply uniquely to EIM balancing authority areas.[28] Such decisions are then added to the consent agenda of the CAISO Board of Governors, meaning the EIM Governing Body's decision is deemed approved unless the CAISO Board of Governors takes an affirmative action to disapprove of the decision. The CAISO Board of Governors cannot modify Tariff provisions that are within the primary authority of the EIM Governing Body unless the EIM Governing Body first approves the Tariff modification.[29] The CAISO Board of Governors considers all other EIM matters—those not within the EIM Governing Body's primary authority—on a non-consent agenda basis. The EIM Governing Body can act in an advisory capacity to the CAISO Board of Governors on all such matters. Finally, any substantive changes to the EIM Charter must first be presented to the EIM Governing Body for advisory input and then approved by the CAISO Board of Governors.[30]

The EIM Charter establishes two additional bodies to inform EIM Governing Body decision-making: the Body of State Regulators (BOSR) and the Regional Issues Forum (RIF). The BOSR is a self-governing advisory body comprised of one utility commissioner from each

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[25] Bonneville presented an overview of the EIM governance structure in a stakeholder meeting, dated October 11, 2018. The presentation can be accessed at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181011-October-11-2018-EIM-Stakeholder-Mtg.pdf.

[26] *See Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities: Recovery of Stranded Costs by Public Utilities and Transmitting Utilities,* Order No. 888, 75 FERC ¶ 61,080, at 280 (1996), 61 Fed. Reg. 21,540 (May 10, 1996), FERC Stats. & Regs. ¶ 31,036 (1996) (explaining that a market operator's independence with respect to governance and with respect to financial interests is fundamental to a functional and competitive market).

[27] Charter for Energy Imbalance Market Governance, CAISO, § 1.1 (rev. Mar. 27, 2019) (EIM Charter), *available at* https://www.westerneim.com/Documents/CharterforEnergyImbalanceMarketGovernance.pdf.

[28] *See also* Guidance for Handling Policy Initiatives within the Decisional Authority or Advisory Role of the EIM Governing Body, CAISO (rev. Mar. 27, 2019), *available at* https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf.

[29] EIM Charter § 2.2.

[30] *Id.* at § 8.

state within the EIM footprint. The BOSR operates as a vehicle for states to identify and convey potential concerns related to EIM impacts on state policies and the retail customers of regulated utilities within their jurisdiction. Publicly owned utilities have no direct representation on the currently constituted BOSR because publicly owned utilities generally fall outside the jurisdiction of a state's public utility commission. The RIF is a forum for stakeholders from various sectors to discuss broad issues related to EIM participation and market design.[31] However, the RIF cannot consider EIM issues that are within an ongoing CAISO policy initiative. The EIM Charter allots each stakeholder sector two liaisons to represent its interests on the RIF.[32] Bonneville is an active participant on the RIF and currently holds one of the two Neighboring Balancing Authority sector liaison seats.

As required by the EIM Charter, there is currently a stakeholder process underway to review the EIM governance structure.[33] In response to stakeholder feedback, the EIM Governing Body commenced its evaluation of EIM governance in December 2018 by releasing a governance review straw proposal for public comment.[34] The CAISO plans to establish a stakeholder-comprised governance review committee to develop a governance proposal(s) through an iterative public process. The committee's proposal(s) for changing the governance structure would then be presented to the EIM Governing Body and Board of Governors for review and approval.

c. Why Bonneville Is Considering Joining the EIM

As described in section I.a, the electric industry in the West is changing rapidly. Although initially developed as a market between the CAISO and PacifiCorp in 2014, the EIM has quickly expanded and now includes participants in two countries and nearly the entire Western Interconnection. Participating entities include, or will include, both private (investor-owned) and public utilities. Many of the EIM Entities now utilizing the EIM to help balance loads and generation in their balancing authority areas are bilateral trading partners with Bonneville.

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[31] *Id.* at § 6.
[32] *Id.* at § 6.2.
[33] *Id.* at § 2.2.4.
[34] *See* EIM Governance Review: Issue Paper and Straw Proposal, CAISO (Dec. 14, 2018), *available at* https://www.westerneim.com/Documents/IssuePaperandStrawProposal-EIMGovernanceReview.pdf.

BPA-2020-00784-F 0015


Western Interconnect Balancing Authority Areas: Energy Imbalance Market
Market Operator
California Independent System Operator
EIM Entity
Active Participant
Planned EIM Entry 2020
Planned EIM Entry 2021
Planned EIM Entry 2022
Bonneville Power Administration
BC Hydro/Powerex
Puget Sound Energy
Seattle City Light
Avista
Bonneville Power Administration
PacifiCorp
PGE
PacifiCorp
Bonneville Power Administration
PacifiCorp
NorthWestern Energy
Idaho Power Co
PacifiCorp
BANC
Nevada Energy
PacifiCorp
Turlock Irrigation District
California Independent System Operator
LA Dept. of Water & Power
Arizona Public Service Co
Salt River Project
Public Service Co. of New Mexico
Tucson Electric Power Co.
Bonneville
Miles
0 50 100 150 200
BA Source: Ventyx, 2013.
Boundaries approximate, not all utilities shown on map.

In light of this rapid industry change and evolution, Bonneville must be ever diligent in exploring ways to maximize the value of the federal power and transmission systems. This means looking for additional marketing opportunities and improving the operations of the federal power and transmission systems.

Over the last two decades, Bonneville has participated in multiple attempts to form an organized market in the Northwest, but for a number of reasons these attempts have failed and the fundamental market for the region continues to be bilateral trades. The EIM is unlike the region's other attempts to create an organized market because it is simply an extension of an existing real-time market. Other market creation efforts attempted to form a Northwest regional transmission organization with full day-ahead markets or other features formed from the ground up, and while regional parties could agree on high level concepts there were always problems solving the details of new market creation.

The EIM, on the other hand, is limited to a real-time market, and all the detailed features have been vetted through multiple stakeholder processes and approved by FERC. Rather than having to build regional consensus around the development of a new market, Bonneville only needs to determine if the EIM in its existing form will work for Bonneville and its customers.

Bonneville has been involved with the creation of the EIM since its early stages. In 2014, the CAISO and PacifiCorp formed the EIM by extending the CAISO's real-time market to PacifiCorp's balancing authority areas. Bonneville had a role because PacifiCorp's western balancing authority area is intertwined with the federal transmission system, and PacifiCorp needed to use its transmission rights on Bonneville's system to make the EIM work.

Bonneville holds transmission contracts with PacifiCorp to serve several Bonneville preference customers, and service under these contracts was affected by the creation of the EIM. Bonneville worked collaboratively with PacifiCorp and the CAISO to accommodate EIM transfers on the federal transmission system and to preserve the rights of our preference customers within PacifiCorp's balancing authority area.

Subsequently, Bonneville has worked with the other Northwest utilities that have joined the EIM. Our role has been to accommodate their use of the Bonneville transmission system while ensuring that the EIM does not impact reliability or any other uses of the system.

In addition, Bonneville has worked closely with the CAISO to develop the Coordinated Transmission Agreement, which established the parameters for how the CAISO will operate the EIM to ensure the continued reliability of the Bonneville transmission system, and

provided for data sharing requirements that improved visibility of the impacts of the EIM on the Bonneville transmission system. Through all these efforts Bonneville has gained a detailed understanding of how the EIM operates, and Bonneville has taken a specific interest in the EIM rules, governance, and stakeholder processes.

Bonneville's Strategic Plan

Bonneville's Strategic Plan outlines the actions the agency will take "to leverage and enable industry change through modernized assets and system operations, and to deliver on our public responsibilities through a commercially successful business."[35] It outlines four strategic goals for the 2018-2023 timeframe:

1. Strengthen financial health.
2. Modernize assets and system operations.
3. Provide competitive power products and services.
4. Meet transmission customer needs efficiently and responsively.[36]

Bonneville's participation in the EIM would be consistent with these strategic goals, and it would leverage industry change that is already happening. Many other entities have joined the EIM, VERs generation output is increasing, and with the help of the EIM system operators are squeezing greater efficiencies from existing transmission and generation assets. Signing the Implementation Agreement is a first step that allows Bonneville to work with the CAISO to develop Bonneville's potential participation in the EIM into a strategic tool that helps ensure Bonneville can more efficiently and effectively meet its obligations while continuing to navigate this period of heightened change in the industry.

Joining the EIM is consistent with Bonneville's goals of increasing its market opportunities and improving the operation of the federal power and transmission systems. As discussed further below, Bonneville's cost-benefit analysis indicates that Bonneville's participation with federal generation resources in the EIM could result in approximately $29-34 million of additional revenue annually for Bonneville. While Bonneville is proposing to join the EIM and pursue these revenue opportunities through bidding federal resources into the EIM, Bonneville will also continue to pursue other opportunities with bilateral transactions and other markets.

Participation in the EIM would also provide Bonneville with valuable new tools to address transmission congestion. Given the diversity of loads and resources now located in the EIM

[35] Bonneville 2018-2023 Strategic Plan at 3 (Jan. 2018), *available at* https://www.bpa.gov/StrategicPlan/StrategicPlan/2018-Strategic-Plan.pdf.
[36] *Id.* at 9.

footprint, Bonneville could leverage the EIM to help address constrained paths in its balancing authority area. Bonneville is well positioned to facilitate solutions to manage the growing congestion in California because of its role as operator of the principal transmission lines connecting the Pacific Northwest with Northern and Southern California, the California-Oregon Intertie and the Pacific DC Intertie respectively. In addition, Bonneville's merchant has a portfolio of firm rights on these paths that it could use for beneficial commercial solutions.

Another benefit to Bonneville becoming an EIM Entity is that it would gain access to additional data and information that would enhance system operations through greater visibility and situational awareness. In 2018, Bonneville initiated a comprehensive "Grid Modernization" project in an effort to update and modernize its systems and processes. This effort is necessary for Bonneville to remain competitive and operate as efficiently as possible. As an EIM Entity, Bonneville would gain access to certain operational tools that would add greater discipline and help operate its balancing authority area more efficiently.

Consistent with its Strategic Plan, Bonneville is also considering other opportunities to market flexible carbon-free federal power. One such opportunity is the CAISO's effort to develop a day-ahead product that incents the commitment of additional flexible capability from resources that can be deployed in real-time. Such a product would provide an opportunity for Northwest hydro and other dispatchable resources that can quickly ramp up or down to make up for unscheduled changes in load and generation. These valuable capabilities will support the reliability of the Western transmission grid as we work to integrate large amounts of additional renewable energy generation. Bonneville has taken an active role in the CAISO's ongoing effort to develop a day-ahead flexible ramping product. Bonneville expects that the CAISO will complete its stakeholder process and implement this product before Bonneville goes live in the EIM.

II. Decision-making Framework for EIM Participation

Overview

Signing an Implementation Agreement is a significant milestone and involves considerable commitment of time and resources. Bonneville has divided joining the EIM into a multi-year series of incremental decisions that culminate in a possible go-live in March of 2022. This series of decisions will determine how Bonneville will participate and how that participation will affect other parties doing business with Bonneville. This step-wise decision making framework limits upfront costs and risks and outlines a clear plan for moving through the various stages required to decide on implementing, joining, and participating in EIM.

BPA-2020-00784-F 0015

Bonneville's series of incremental decisions are divided into five phases. Through these Bonneville will decide whether and how to join the EIM, as well as navigating the required implementation steps for participation in the EIM. The five phases of Bonneville's decision process are:

1. Phase I – Exploration from July 2018 through June 2019
2. Phase II – Implementation Agreement, EIM principles, and some policy decisions from June 2019 through September 2019
3. Phase III – Additional policy decisions from October 2019 through August 2020
4. Phase IV – Rate and Tariff Proceeding from October 2020 through July 2021
5. Phase V – Close-Out Letter from October 2021 through December 2021

Each phase is described below.

Phase I – Exploration (July 2018 to June 2019)

Phase I was EIM exploration for Bonneville and its stakeholders, the time immediately preceding this Proposal during which Bonneville and stakeholders were learning about the mechanics of the EIM and exploring details and nuances related to joining and participating in the EIM. During the exploration phase, from July 2018 through June 2019, Bonneville held monthly public meetings on particular topics related to the EIM. Bonneville sought informal comment from stakeholders, and those comments were addressed verbally at subsequent public meetings or one-on-one with the commenter.

The topics discussed in the meetings during the exploration phase are the following:

1. Treatment of Transmission
2. Generation Participation Model (FCRPS)
3. EIM Governance
4. Cost-Benefit Analysis
5. Balancing Authority Area Resource Sufficiency
6. EIM Settlements
7. Use of Reliability Tools such as Operational Controls for Balancing Reserves (OCBR) and Oversupply Management Protocol (OMP)
8. Load Zone
9. Market Power and Default Energy Bid (DEB)
10. Carbon Obligation in the EIM
11. Relationship of the EIM to other emerging markets

The materials presented at those meetings and comments received are posted at https://www.bpa.gov/Projects/Initiatives/EIM/Pages/Energy-Imbalance-Market.aspx. In

addition to the monthly public meetings, Bonneville staff met with stakeholders who requested meetings to discuss specific issues of interest to them during the exploration phase.

Phase II –Implementation Agreement and high level issue analysis, including deciding on overarching principles for joining the EIM, and decisions on several policy issues (June 2019 to October 2019)

Phase II has been initiated with the publishing of this Proposal. This Proposal and the associated policy development, stakeholder comments, and Bonneville responses are the key components of Phase II. The Proposal includes a proposal to sign the Implementation Agreement, a discussion of Bonneville's legal authority and business reasons for considering joining the EIM, proposed principles that Bonneville will follow throughout the remaining phases of Bonneville's EIM decision process, and proposed policy decisions on certain issues that have been covered in Bonneville's stakeholder meetings during Phase I of the process. Stakeholders may comment on the content of this Proposal, and then Bonneville will publish a Record of Decision (ROD) addressing comments received. The ROD will contain Bonneville's decision on whether to sign the EIM Implementation Agreement with the intent to join the EIM in 2022 and will respond to comments on the other policy and implementation decisions covered in this Proposal.

In Phase II, Bonneville is moving on to development of systems and technical knowledge of the EIM to position itself to participate in the EIM. Signing the Implementation Agreement initiates a particular set of technical work by the CAISO and Bonneville to prepare for Bonneville's potential participation in the EIM, and it commits Bonneville to pay the CAISO six equal payments of $311,650, due upon the completion of six milestones, for a total payment of $1,870,000. In addition, Bonneville will initiate a series of investments in internal systems and processes that are estimated to cost $30-35M (Start-up costs).[37]

The decisions that are proposed to be made or established in the September 2019 ROD are:

1. Whether to sign the EIM Implementation Agreement,
2. Bonneville's legal authority to join the EIM,
3. Bonneville's business case for joining the EIM,
4. What Bonneville's EIM principles will be, and

[37] Section III.d.2.i discusses these start-up costs.

BPA-2020-00784-F 0015

5. Decisions on the following policy issues:
   a. Federal Generation Participation Model
   b. Transmission Usage—Interchange
   c. Use of Reliability Tools such as OCBR and OMP
   d. Carbon Obligations and related considerations
   e. Market Power (Local Market Power Mitigation (LMPM) and DEB)
   f. Load Zone
   g. Resource Sufficiency—Balancing Authority Area

The decisions being made in the September 2019 ROD will be final decisions, meaning stakeholders' opportunity to raise issues and concerns regarding these proposals is during the current comment period. After Bonneville makes decisions on these issues in the September 2019 ROD, those decisions will not be revisited during subsequent phases of this decision process unless there is a significant change in the underlying facts or in the way the EIM operates. Although the decisions being made in the September 2019 ROD will be final decisions, they will not be ripe for judicial review unless and until Bonneville makes a decision to join the EIM. Bonneville seeks stakeholder comment on all decisions being proposed in this Proposal. Comments are due on July 22, 2019. Bonneville will issue a ROD in September 2019 addressing comments received and making decisions on the items listed above.

Phase III – Additional Policy Decisions (October 2019 to August 2020)

If the outcome of Phase II is that Bonneville decides to sign the Implementation Agreement, Phase III will commence immediately after Bonneville publishes the ROD in September 2019 and signs the Implementation Agreement. During Phase III Bonneville will continue holding EIM stakeholder meetings to discuss the remaining important policy issues that are not being covered in this Proposal and the ROD.

The policy issues that will be addressed in Phase III are the following:

1. Transmission Usage—Network
2. Allocation of EIM Charge Codes
3. Resource Sufficiency—Sub-Balancing Authority Area level
4. Transmission Losses
5. Non-federal Resource Participation Requirements
6. Settlements/Billing (Mechanics)
7. Data Submission Requirements
8. Metering Requirements

BPA-2020-00784-F 0015

If Bonneville learns of additional policy issues that need resolution, they will be added to this list.[38]

During Phase III, EIM stakeholder meetings will continue and will flow into pre-rate and pre-Tariff proceeding workshops as appropriate. Some of the policy issues may be resolvable outside of the rate and Tariff proceedings. For those issues, Bonneville will present written proposals covering the issues, take formal written comments on these proposals, and will issue decision documents addressing the comments received and setting out decisions on these policy issues. For issues that will need to be decided in the rate and Tariff proceedings, those issues will continue to be discussed in pre-rate and pre-Tariff proceeding workshops in preparation for the TC-22 and BP-22 proceedings.

Phase IV – Tariff Terms and Conditions Case and Rate Case (October 2020 to July 2021)

During Phase IV, the policy decisions made in Phases II and III will be implemented through the TC-22 Tariff Terms and Conditions proceeding and the BP-22 rate case proceeding. The TC-22 proceeding will establish EIM-related terms and conditions that will become part of Bonneville's Tariff and will apply to Bonneville's transmission customers. The BP-22 rate proceeding will establish the EIM-related rates and cost allocations that will apply to Bonneville customers. The EIM terms and conditions and the applicable rate changes associated with EIM participation will not become effective until Bonneville begins participation in the market. Thus, the applicability of the EIM terms and conditions and rates will depend on Bonneville's final decision regarding joining the EIM, which will take place after the cases are completed and during the BP-22 rate period.

The BP-22 proceeding is a well-established process that follows section 7(i) of the Northwest Power Act, 16 U.S.C. § 839e(i), and associated rules, Final Rules of Procedure, 83 Fed. Reg. 39,993 (Aug. 13, 2018). The EIM-related rates that result from the BP-22 proceeding will be final decisions, reviewable pursuant to section 9(e)(1)(G) of the Northwest Power Act, 16 U.S.C. § 839f(e)(1)(G). The TC-22 proceeding is conducted in accordance with section 9 of Bonneville's Tariff, which provides the Administrator with the ability to change Tariff terms and conditions after conducting a proceeding in accordance with Section 212(i)(2)(A) of the Federal Power Act (requiring the proceeding to follow most of the processes set forth in section 7(i) of the Northwest Power Act) and issuing a final decision which considers factors set forth in Tariff section 9. The EIM-related terms

[38] These issues are described and discussed briefly in section V.

BPA-2020-00784-F 0015

and conditions adopted by the Administrator in the TC-22 proceeding will be final decisions.

Phase V – Close-Out Letter (October 2021 through December 2021)

After the conclusion of the TC-22 and BP-22 proceedings, Bonneville will make a final decision whether to join the EIM. If Bonneville's choice is to join the EIM, Bonneville will write a letter stating that proposed decision and setting out how that decision is consistent with Bonneville's principles for joining the EIM that are being established in Phase II. Stakeholders will have an opportunity to comment on this proposed decision, and then Bonneville will publish a final Close-Out Letter addressing the comments received and setting out its decision on joining the EIM. If Bonneville makes the decision to join the EIM, that will be a final action ripe for judicial review under section 9(e) of the Northwest Power Act, 16 U.S.C. § 839f(e).

If Bonneville makes the decision to join the EIM, Bonneville plans to begin financial binding transactions in the EIM (Go Live) in March 2022. Bonneville will sign an EIM Entity Agreement and the various other CAISO agreements necessary for joining and participating in the EIM before the Go Live date.

The above proposed process is intended to provide a transparent roadmap for Bonneville and its stakeholders that will provide structure and opportunity for input to the multiple decisions that are required for Bonneville to join the EIM. Please provide comments on this proposed process.

III. Proposed Determinations and Policies for Joining the EIM

a. Bonneville's EIM Participation Principles

Proposal: Bonneville proposes to adopt the four principles discussed in more detail below as the foundational principles that Bonneville will continue to use in its evaluation of potentially joining the EIM. Bonneville seeks stakeholder input and comment on each of these principles, and on whether additional principles should be considered.

Given Bonneville's status as a federal power marketing administration and mandate to market the output of federal resources while reliably serving loads in the Pacific Northwest, Bonneville believes it is important to first identify and apply a set of foundational principles to its potential participation in the EIM. In that regard, Bonneville has identified and is proposing the four principles discussed below. Bonneville first identified and solicited feedback on these principles at its October 11, 2018, EIM

stakeholder meeting. Bonneville has identified, discussed, and reviewed the principles in every monthly subsequent stakeholder meeting. Bonneville has modified the principles in response to stakeholder comment since first proposing them.

As discussed in section II, Bonneville will continue to apply these principles throughout the EIM process. The principles will form the basis for Bonneville's decision in the final Close-Out Letter to either join or not join the EIM.

It is important to note that these principles are high-level and foundational to Bonneville's participation in the EIM. As Bonneville progresses through the process of potentially joining the EIM, certain issues will require the development and application of more specific principles. For example, the potential development of additional standards regarding resource sufficiency within Bonneville's balancing authority area or the allocation of the benefits/costs of EIM participation will likely require more specific principles. Such principles will be developed in the appropriate stakeholder process during Phase III.

1. Participation Is Consistent with Statutory, Regulatory, and Contractual Obligations

Bonneville's potential participation must be consistent with its statutory, regulatory, and contractual obligations. Section III.b discusses whether Bonneville's participation in the EIM as it is currently constructed would be consistent with these obligations. Bonneville's analysis preliminarily concludes, subject to stakeholder comment and input, that Bonneville's participation would be consistent. In the event Bonneville determines in the future that EIM participation would no longer be consistent with these obligations, it would cease participating in the market and address the inconsistency. Conceptually, this could arise if the CAISO implemented a Tariff provision or business practice, or FERC ordered a change to the current EIM, that was inconsistent with the statutory, regulatory, or contractual obligations applicable to Bonneville.

2. Maintain Reliable Delivery of Power and Transmission to Our Customers

Even if Bonneville joins the EIM, Bonneville still retains the responsibility for the operation of the federal power and transmission systems. Joining the EIM does not obviate Bonneville's responsibility regarding system reliability. If Bonneville were to determine in the future that EIM participation impaired its ability to maintain the reliability of the federal power or transmission systems, it would stop participating in the EIM and address

BPA-2020-00784-F 0015

the reliability issue. In fact, participation in the EIM should help system reliability in terms of managing transmission constraints on Bonneville's transmission system.[39]

3. Resource Participation in the EIM Is and Always Will Be Voluntary

In regard to resource participation, the EIM is a voluntary market. Owners/operators of resources inside the Bonneville balancing authority area can choose whether to participate or not. As described in section I.b, those that choose to participate, including Bonneville on behalf of the federal generating resources, must execute a Participating Resource agreement with the CAISO. Moreover, even owners/operators that sign a Participating Resource agreement with the CAISO are not required to submit bids for any particular market interval. Stated another way, the EIM does not impose "must-run" requirements on any resources within an EIM balancing authority area. Bonneville recognizes that in some cases, if it chooses not to bid federal generation into the EIM, there may be a reduction in dispatch benefits. Furthermore, Bonneville, in its role as an EIM entity, may choose to separate from or exit the EIM if conditions arise that are inconsistent with these principles.

4. Bonneville's Decision to Participate in the EIM Will Be Based on a Sound Business Rationale

Bonneville's decision whether to join the EIM will be based on a reasoned business decision. The decision will include a business case which considers both quantitative and qualitative benefits to power and transmission as well as the strategic value of joining the EIM. The business case is discussed in section III.d.

Conclusion

Bonneville is proposing to make these four principles final in terms of the high-level, foundational principles that drive Bonneville's determination whether to join the EIM. The final determination in Bonneville's Close-Out Letter will utilize these principles in making the decision. Bonneville requests stakeholder input on these principles and whether other, additional principles should be considered.

[39] Bonneville's system operations tools are discussed in Section III.e.3.

BPA-2020-00784-F 0015

b. Bonneville's Legal Authority to Join the EIM

Introduction

Joining the EIM will require operational changes for both Bonneville power and transmission functions, and it will expose Bonneville to new governance and regulatory structures. Bonneville's legal evaluation of the proposed changes at this early stage of the decision process is critical to ensure that there are no legal barriers to Bonneville's potential participation. It is also important to identify the important legal issues early in the process to inform the stakeholder process.

Bonneville's preliminary determination is that it has the legal authority to join the EIM and that a decision to join the EIM is consistent with its statutory obligations and legal requirements. Bonneville assessed the following issues to determine whether Bonneville's statutory and contractual obligations are consistent with a decision to join the EIM.

1. General authority to operate in a business-like manner and to join the EIM
2. Obligations with respect to preference to power and surplus power requirements
3. Obligation to make sales from the Federal System and bidding power into the EIM from specific projects or groups of projects
4. Statutory authority to provide transmission service
5. Consistency with contractual commitments: Power Contracts and Transmission Contracts
6. Federal Energy Regulatory Commission jurisdiction with respect to Bonneville as an EIM entity
7. Market oversight under the CAISO Tariff
8. Governance

The following legal assessment is based on Bonneville's current understanding of the EIM. If there are significant structural or organizational changes to the EIM after this decision, Bonneville will evaluate those changes as Bonneville moves through the implementation stage toward participation to ensure continued consistency with Bonneville's legal obligations.

BPA-2020-00784-F 0015

1. Joining the EIM Is an Exercise of Bonneville's Authority to Operate in a Business-Like Manner

Position: The Administrator's decision to join the EIM furthers Bonneville's business interests consistent with its power marketing directives and legal requirements.

Since its inception, Congress has imbued Bonneville with broad statutory authority to market the power produced by the federal projects. In the Bonneville Project Act of 1937, the Secretary of the Army was directed to provide the Administrator with such space and equipment at the Bonneville Dam as may be necessary to transmit the energy produced at the dam "to the markets which the administrator desires to serve."[40] Congress also granted Bonneville broad contracting authority for the specific purpose of allowing Bonneville to operate like a business in the marketing of federal power.[41] As the designated "marketing agent" for all electric power generated by the Federal Columbia River Power System,[42] Bonneville must set rates for the sale of power from these projects pursuant to several principles, including setting rates "consistent with sound business principles."[43] Bonneville's statutes are unique with repeated focus on the business-related aspects of the agency's authority.

Both Congress and the courts have reaffirmed Bonneville's authority to operate in a business-like manner. As summarized in a 1977 Senate Report:

> [The] legislative history [of the statutes governing BPA's operations] reflects a congressional recognition of the significant role played by BPA in the Pacific Northwest, and an effort to enable this organization to operate in a businesslike fashion and to free it from the requirements and restrictions ordinarily applicable to the conduct of Government business. The transfer of the functions of BPA from the Department of the Interior to the Department of Energy is not intended to diminish in any way the authority or flexibility which is a requisite to the efficient management of a utility business.[44]

The ability of Bonneville to adapt to the ever-changing landscape of the energy market like a business is particularly important because the Administrator must implement many, and often competing, statutory directives. Similarly, the Ninth Circuit Court of Appeals has

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[40] Bonneville Project Act, 16 U.S.C. § 832a(a).
[41] *Id.* § 832a(f). *See* S. R. No. 469, 79th Cong., 1st Sess. 13 (1945) ("[BPA] operates a business enterprise . . . .") (letter from Interior Secretary Ickes).
[42] Transmission System Act of 1974, § 8, 16 U.S.C. § 838f.
[43] Flood Control Act of 1944, 16 U.S.C. § 825s.
[44] S. R. No. 164, 95th Cong., 1st Sess. 30 (1977), reprinted in 1977 U.S.C.C.A.N. 854, 884.

noted that "[The Administrator] must continue to run [Bonneville] like a business on a sound financial basis, enabling it to repay its debt to the federal treasury in a timely fashion, while discharging costly new public duties assumed after the Northwest Power Act's passage."[45] Further, Bonneville must explain how its decision furthers the agency's business interests or its public mission.[46]

The EIM presents a unique opportunity for Bonneville to further its business interest by entering a new market that is expected to provide Bonneville, through its transmission and power functions, significant economic and operational benefits. Much of the western half of the United States is undergoing unprecedented changes in its energy industry and markets. As described earlier, almost all of Bonneville's interconnected balancing authorities in the West have or are in the process of joining the EIM. If Bonneville takes no action, it could stand alone as the sole western balancing authority area to choose not to take the opportunity to benefit from participation in the EIM. Bonneville's consideration of whether to join or participate in an EIM in furtherance of its power and transmission marketing efforts is an important consideration in how Bonneville will meet its mission objectives in the future.

As explained below in section III.d, Bonneville's decision to join the EIM would be founded on significant projected quantitative and qualitative benefits to Bonneville and its customers. In addition, Bonneville believes that joining the EIM will support its ability to meet its statutory obligations. Bonneville's proposed model for participating in the EIM is intended to further Bonneville's business interests consistent with its public mission and to ensure its public and contractual responsibilities and obligations continue to be met first.

2. Joining the EIM Is Consistent with Preference and Surplus Requirements

Position: Bonneville's proposed participation in the EIM is consistent with the preference and surplus requirements of federal law.

Preference

Bonneville's authority to sell federal power is grounded in several statutes: the Bonneville Project Act of 1937,[47] the Pacific Northwest Consumer Power Preference Act of 1964,[48] the

[45] *Ass'n of Pub. Agency Customers v. Bonneville Power Admin.*, 126 F.3d 1158, 1170-71 (9th Cir. 2003).
[46] *Pac. Nw. Generating Co-op v. Bonneville Power Admin.*, 550 F.3d 846, 861 (9th Cir. 2009).
[47] *See* 16 U.S.C. §§ 832 *et seq.*
[48] *See* 16 U.S.C. §§ 837 *et seq.*

Federal Columbia River Transmission System Act of 1974,[49] and the Pacific Northwest Electric Power Planning and Conservation Act of 1980.[50] Collectively, these statutes form the basis for Bonneville's power marketing authority, but also prescribe the Administrator's obligation to provide preference and priority to public body and cooperative customers over non-preference entities (investor-owned utilities and direct service industrial customers) when there are competing requests for power.[51] After these regional power customers' needs have been met, Bonneville, on a discretionary basis, can sell power as available to other entities both in and out of the Pacific Northwest region.[52] Meeting public and regional preference directives is a fundamental statutory obligation for Bonneville.

Bonneville's proposal to join the EIM is consistent with the provisions of law relating to public and regional preference. The EIM is a voluntary market and Bonneville is not required to bid in federal generation. If there are competing applications from eligible customers for Bonneville's power, Bonneville will follow the statutorily prescribed order of sales, giving applicable preference to public bodies and cooperatives, then regional customers, and finally to out-of-region purchasers. The EIM does not change Bonneville's statutory marketing paradigm.

Surplus

Bonneville has historically sold federal power on a long term basis to serve its regional power customers' retail load requirements on a firm and continuous basis.[53] This type of power is known as firm power. Pursuant to section 5(f) of the Northwest Power Act, federal power remaining after Bonneville has met all of its section 5(b), (c), and (d) power

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[49] *See* 16 U.S.C. §§ 838 *et seq.*

[50] *See* 16 U.S.C. §§ 839 *et seq.*

[51] *See, e.g.,* 16 U.S.C. § 832c(a):

> In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and cooperatives.

See also 16 U.S.C. § 839c(a) ("All power sales under this Act shall be subject at all times to the preference and priority provisions of the Bonneville Project Act of 1937 . . . ."). *See also Aluminum Co. of Am. v. Cent. Lincoln Peoples' Util. Dist.*, 467 U.S. 380, 393 (1984) ("But the preference system merely determines the priority of different customers when the Administrator receives 'conflicting or competing' applications for power that the Administrator is authorized to allocate administratively.").

[52] *See* 16 U.S.C. § 837a; 16 U.S.C. 839c(f); *Aluminum Co. of Am. v. Bonneville Power Admin.*, 903 F.2d 585, 588 (9th Cir. 1990).

[53] *See* Committee report on energy and natural resources, H. R. No. 96-272, 96th Cong. 1st Sess. at 26 (July 30, 1979).

BPA-2020-00784-F 0015

obligations, may be sold as "surplus" power.[54] As with other sales of power from the federal system, Bonneville is required to give preference and priority to public body and cooperative (preference) customers when it offers to sell surplus power.[55] If no preference customers request a purchase of Bonneville's surplus power, Bonneville may sell that power to a regional non-preference customer.[56] If no regional customer purchases the surplus power, Bonneville may then sell such power to out-of-region customers on a preference basis, after meeting certain conditions.[57]

For the reasons set forth in this letter, Bonneville believes the EIM is likely to bolster its ability to fulfill its obligations to meet its regional customers' firm power requirements consistent with its statutes and its customers' contracts. As noted above, the EIM is a voluntary market, meaning Bonneville will determine, each hour, whether and to what extent it will bid any remaining federal capability (after all existing contractual and statutory obligations have been met) into the EIM for economic dispatch. If federal generation is dispatched in response to the EIM, the resulting energy could be used to serve either in region or out of region imbalance. As such, to satisfy the notice requirements of making surplus power sales out of region, Bonneville will update its regional notice of available surplus to include provisions regarding Bonneville's potential sales in the EIM.

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[54] 16 U.S.C. § 839c(f).

[55] Preference applies to the sale of surplus. Section 5(a) of the Northwest Power Act, 16 U.S.C. § 839c(a), states:

> *All power sales* under this chapter shall be subject at all times to the preference and priority provisions of the Bonneville Project Act of 1937 (16 U.S.C. 832 and following) and, in particular, sections 4 and 5 thereof [16 U.S.C. 832c and 832d].

(Emphasis added.)

[56] The conditions include:

> (1) Bonneville must notify Northwest customers of its intent to sell surplus energy out of region (and allow review of draft agreements if requested);
> (2) the sales contract must contain a 60 day notice of termination and recall for energy sales if needed to serve regional energy need; and
> (3) the contract must contain a 60 month notice of termination and recall for capacity sales.

See 16 U.S.C. §§ 837a, 837b(a), (c).

[57] Section 9(c) of the Northwest Power Act, 16 U.S.C § 839f(c), states:

> In applying such sections for the purposes of this subsection, the term "surplus energy" shall mean electric energy for which there is no market in the Pacific Northwest at any rate established for the disposition of such energy, and the term "surplus peaking capacity" shall mean electric peaking capacity for which there is no demand in the Pacific Northwest at the rate established for the disposition of such capacity.

See also § 1(c)-(d) of the Preference Act, 16 U.S.C. § 837(c)-(d):

> "Surplus energy" means electric energy generated at federal hydroelectric plants in the Pacific Northwest which would otherwise be wasted because of the lack of a market therefor in the Pacific Northwest at any established rate.
>
> "Surplus peaking capacity" means electric peaking capacity at federal hydroelectric plants in the Pacific Northwest for which there is no demand in the Pacific Northwest at any established rate.

BPA-2020-00784-F 0015

3. Bonneville's Decision to Bid Generation into the EIM Is Consistent with Its Obligation to Make Sales from the Federal System

Position: Bidding in capacity from specific federal hydroelectric dams or groups of federal hydroelectric dams is consistent with Bonneville's statutes.

Background and Context

Bonneville meets its customers' power needs from the FCRPS by selling federal power as a "system sale." Under a "system sale," Bonneville meets its power obligations by using all the electric power produced in aggregate by the FCRPS and acquired non-federal resources. Bonneville's system sales are different than sales from other federal power marketing administrations, which market statutorily-authorized allocations of federal power on a project-by-project basis.

Bonneville's system sale model of marketing power developed as the FCRPS expanded. As each new project in the Columbia River Basin was completed, Bonneville was directed by statute or executive order to market the output of that project. In the Bonneville Project Act of 1937, Bonneville was established to market the power generated from the Corps of Engineers' newly completed Bonneville Dam.[58] Then, in 1940, Bonneville was directed to also market power from the Bureau of Reclamation's Grand Coulee Dam by Executive Order No. 8526.[59] Bonneville was directed to market power from the Corps' lower Columbia projects in the Flood Control Act of 1944,[60] and from the Lower Snake river projects in the Rivers and Harbors Act of 1945.[61] In 1951, Bonneville was directed by Secretarial Order to market power from all Corps projects "now and hereafter constructed in the drainage basin of the Columbia River and its tributaries . . . in the States of Washington and Oregon."[62] Bonneville was similarly directed by Secretarial Order to market power from all Bureau projects in the Pacific Northwest.[63] Regarding rates based on system sales, the Secretary directed Bonneville to "extend the benefits of uniform rate

[58] Bonneville Project Act, § 2(a), 16 U.S.C. § 832a(a).
[59] Coordinating the Electrical Facilities of Grand Coulee Dam Project and Bonneville Project, 5 Fed. Reg. 3,390 (Aug. 26, 1940).
[60] Flood Control Act of 1944, ch. 665, § 5, 16 U.S.C. § 825s.
[61] River and Harbor Act of 1945, Pub. L. No. 79-14, § 2, 59 Stat. 10, 22 (1945).
[62] Sec. of Interior Order No. 2663, 17 Fed. Reg. 5,197 (1951).
[63] *See* Sec. of Interior Order No. 1994, 9 Fed. Reg. 11,966 (1944) (Hungry Horse); Sec. of Interior Order No. 2115, Amendment 1, 18 Fed. Reg. 2,831 (1953) (Chandler); and Sec. of Interior Order No. 2753, Amendment 1, 22 Fed. Reg. 1,090 (1957) (Roza); Sec. of Interior Order No. 2860, 27 Fed. Reg. 591 (1962) ("all projects now or hereafter constructed in the drainage basin of the Columbia River . . . in Washington and Oregon").

BPA-2020-00784-F 0015

schedules and integrated power services to all parts of his marketing area" in a 1966 order on marketing from Snake River Basin projects.[64] Finally, in the Transmission System Act of 1974, Bonneville was designated as the "marketing agent" for all electric power generated by federal generating plants in the Pacific Northwest, excepting only the electric power required for the operation of each federal project and power from the Green Springs project of the Bureau.[65]

Bonneville's system sales approach is not only historical artifact; Bonneville adopted the system sales approach to comply with various statutory and executive directives. These directives appeared in the early marketing authorizations and refinement in the Northwest Power Act.[66] These directives fall into three general categories:

- Directives to integrate and operate the federal projects as a single system to efficiently and economically market energy;[67]

- Directives to meet the firm power load obligations of Bonneville's customers using "Federal base system resources" (note that resources is plural not singular);[68]

- Directives to recover the "total system costs" of the FCRPS.[69]

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[64] Sec. of Interior Order No. 2860, amended by 27 Fed. Reg. 591 (1962), 28 Fed. Reg. 5, 273 (1963), 31 Fed. Reg. 13,560 (1966) (emphasis added).

[65] Transmission System Act, § 8, 16 U.S.C. § 838f.

[66] Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. § 839 *et seq.*

[67] *See, e.g.,* Secretary of the Department of Interior, Harold Ickes, Senate Committee on Commerce hearings on H.R. 3961 (May 1944):

> Physical integration of the power facilities at these new projects with the existing facilities of the Bonneville Power Administration will be needed for most efficient and economical marketing of energy. At present the Administration maintains a network of high-voltage transmission lines in Oregon and Washington over which the power generated at Bonneville and Grand Coulee Dams is sold, and with which the proposed new projects should be interconnected in order to make the best use of all available power.

[68] The Northwest Power Act, § 3(10), defines "Federal base system resources" as "(A) the Federal Columbia river Power System hydroelectric projects; (B) resources acquired by the Administrator under long-term contracts in force on December 5, 1980; and (C) resources acquired by the Administrator in an amount necessary to replace reductions in capability of the resources referred to in subparagraphs (A) and (B) of this paragraph." 16 U.S.C. § 839a(10). The Regional Preference Act, § 2, provides that "the sale, delivery, and exchange of electric energy generated at, and peaking capacity of, federal hydroelectric plants in the Pacific Northwest for use outside the Pacific Northwest shall be limited to surplus energy and surplus peaking capacity." 16 U.S.C. § 837a. This language refers to federal hydroelectric plants. Because it is in the plural form it is language that encompasses the whole, or interconnected, system of federal hydro projects.

[69] The Northwest Power Act directs the Administrator to establish rates "based upon the Administrator's total system costs" and for requirements customers to "recover the costs of that portion of the Federal base system resources needed to supply such loads. . . ." 16 U.S.C. §§ 839e(a)(2)(B), 839e(b)(1). These rate directives

BPA-2020-00784-F 0015

The EIM is a security constrained economic dispatch that matches loads with the least expensive generation bid into the market taking into account congestion and transmission losses. As such, a general premise of the EIM is that generation bid into the market is not from an aggregated system sale but sourced from specific locations on the integrated grid. This can be either individual generation projects or groupings of projects that are geographically located close to one another so as not to have significantly different impacts on the grid.

Participation in the EIM with federal generation will require specific information on the source of the federal generation being used to respond to EIM dispatches. The legal question is whether Bonneville can provide the specific system information required by the EIM and still comply with the statutory and executive directives that have historically resulted in Bonneville selling power from the aggregated federal system.

Bidding into the EIM Federal Generation at Specific Projects or Group of Projects Is Consistent with Bonneville's Statutory Directives

Bonneville believes that participating in the EIM with specific projects or groups of projects is consistent with the statutory and executive directives that have led Bonneville to historically sell power from the federal system.

First, bidding federal capacity into the EIM, even on an individual project level, will not pose a risk to the integration, coordination, or efficient operation of the federal projects as a single system. Like all participants, Bonneville (in coordination with the Corps and Reclamation) will determine what capacity to bid into the EIM. In this way, federal control will remain over (1) coordinating and controlling the FCRPS projects to meet all federal obligations; (2) determining which projects and generating units will operate and how much flexibility is available at each project; and (3) the amount of transmission that Bonneville Power Services makes available for EIM transactions.[70]

Second, participation in the EIM with specific federal projects will not pose a risk to Bonneville's ability to meet its firm power sales obligations. These obligations will continue to be met from the collective system resources of the FCRPS. The EIM preserves this functionality by allowing Bonneville to include these aggregated obligations as part of

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align with the system sale paradigm in that they direct Bonneville to set rates to recover the costs of the entire federal system, which presumes that Bonneville is using the entire system to serve its customers' loads.

[70] See section III.e.1.

BPA-2020-00784-F 0015

the "base schedule"[71] that Bonneville submits to the EIM. As such, Bonneville will retain its current discretion to meet these obligations from the federal projects as a single system.

Third, bidding in capacity from specific federal projects will not impair Bonneville's ability to recover its "total system costs." Bonneville will continue to sell firm requirements power to its regional customers under long-term contracts from system resources at rates set by Bonneville's statutory directives. To the extent Bonneville makes surplus power sales into the EIM, Bonneville will be compensated by the EIM at rates consistent with the bid ranges submitted with Bonneville's dispatches. The cost and benefits of those surplus power sales will, in turn, be included in Bonneville's rates. Thus, Bonneville's ability to recover total system costs from its customers will remain.

4. Joining the EIM Is Consistent with Bonneville's Statutory Authority to Provide Transmission Service

Position: Bonneville's proposed participation in the EIM is consistent with Bonneville's statutory authority to provide transmission service.

To join the EIM, Bonneville would have to make certain limited changes to the terms and conditions under which Bonneville provides transmission service to its customers. The changes needed to participate would be EIM-specific and would not fundamentally alter Bonneville's existing paradigm for providing transmission service. For example, as described in section I.b, non-federal resources within an EIM Entity's balancing authority area can be bid into the market as Participating Resources. The EIM also requires that EIM participants submit base schedules on an hourly basis, which is based on the exchange of certain data between entities within the balancing authority area. The specific criteria to facilitate these and other EIM-specific protocols are governed by the EIM Entity's Tariff. Bonneville would consider such EIM-specific changes to the terms and conditions of its Tariff to coincide with its participation in the EIM.

Within Bonneville's broad statutory parameters, the Administrator has the authority to establish terms and conditions for transmission service, including terms and conditions that would reflect EIM membership. This authority arises under section 2(b) of the Bonneville Project Act; section 6 of the Pacific Northwest Consumer Power Preference Act of 1964; and sections 4 and 6 of the Federal Columbia River Transmission System Act.[72] In brief, these statutes authorize the Administrator to operate and build the federal

[71] *See* section I.b.
[72] 16 U.S.C. § 832a(b); 16 U.S.C. § 837e; 16 U.S.C. §§ 838b, 838d.

BPA-2020-00784-F 0015

transmission system as the Administrator determines is appropriate and necessary for a number of reasons, including the construction of facilities to integrate and transmit federal and non-federal power, provide service to Bonneville's customers, provide interregional transmission facilities, and maintain the stability and reliability of the federal system.[73]

Bonneville's statutes also provide the Administrator with broad authority to establish the terms and conditions of transmission service.[74] Specifically, Section 2(f) of the Bonneville Project Act provides as follows:

> Subject only to the provisions of this Act, the Administrator is authorized to enter into such contracts, agreements, and arrangements, including the amendment, modification, adjustment, or cancellation thereof, and the compromise or final settlement of any claim arising thereunder, and to make such expenditures, upon such terms and conditions and in such manner as he may deem necessary.[75]

This grant of contracting authority to the Administrator is based on the premise that Bonneville operates as a business, and provides Bonneville the needed discretion to function in a business-oriented manner.[76]

If Bonneville decides to join the EIM, it will revise its Tariff in accordance with the process established in the 2020 Terms and Conditions Proceeding. This process, which is set out in section 9 of Bonneville's Tariff, requires Bonneville to conduct a proceeding in accordance with Section 212(i)(2)(A) of the Federal Power Act, and make a decision based on several factors enumerated in section 9(a)(1) of the Tariff.

Bonneville must also revise its transmission and ancillary and control area services rates to join the EIM. Bonneville sets rates in accordance with section 7 of the Northwest Power Act. Section 7(a), in general, directs the Administrator to establish and recover in accordance with sound business principles the cost associated with, among other things, transmission of power. In the specific, section 7(a)(2)(C) directs that transmission rates equitably allocate the costs of the federal transmission system between federal and non-

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[73] *Id.*
[74] 16 U.S.C. §§ 832a(f), 839f(a).
[75] 16 U.S.C. § 832a(f).
[76] Hearing on H.R. 2690 and H.R. 2693 Before the H. Comm. on Rivers and Harbors, 79th Cong. 2 (1945) (statement of Rep. Jackson).

federal power utilizing the system. If Bonneville decides to join the EIM, it will continue to set rates pursuant to the requirements of section 7 of the Northwest Power Act.

5. Joining the EIM Is Consistent with Bonneville's Contractual Commitments

Bonneville's Power Contracts

Position: Bonneville's proposed participation in the EIM is consistent with Bonneville's contractual commitments and obligations under its power sales contracts.

Bonneville does not anticipate any conflicts between its participation in the EIM and its current Northwest Power Act section 5(b)(1) firm requirements power sales contracts that were offered and executed in 2011 as Regional Dialogue Contract High Water Mark (RD CHWM) contracts. The EIM is a within-hour balancing market in which Bonneville's participation would be voluntary, not mandatory, meaning that Bonneville will have the choice of whether to bid surplus power not otherwise committed to meet existing contract obligations into that market.

Bonneville's RD CHWM requirements power sales contracts are of three types: i) load following contracts, which are hour ahead prescheduled contracts for firm power to meet the hourly firm load of the customer; ii) Slice/Block contracts, which are hour ahead prescheduled contracts for calculated planned amounts of power scheduled by the customer for the upcoming hour; and iii) Block only contracts, which are hour ahead prescheduled contracts for planned fixed amounts of power scheduled by the customer for the upcoming hour. Since Bonneville's obligation is determined in the hour ahead of the delivery hour, Bonneville will have set its generation requirement to meet the total of these anticipated planned amounts of power and actual hourly demand for load following for the upcoming hour. Bonneville will ensure that it has met its contractual obligation to deliver power to its customer for the next hour before Bonneville allows the EIM to dispatch any amount of additional power available for that hour.

In addition, Bonneville will continue to maintain sufficient capability to cover any real time load excursions of its load following customers during an hour. Bonneville's Slice/Block and Block only purchasers do not have an ability to change their planned amounts of scheduled power during the hour of delivery. Bonneville's power obligation to these customers during a delivery hour is not subject to change once it has been set by the customer and Bonneville. Therefore, Bonneville's ability to meet its load obligations under the aforementioned contracts will not be affected by its bids into the EIM during an hour.

BPA-2020-00784-F 0015

It should be noted that although Bonneville's RD CHWM contracts contain a provision on resource adequacy, that provision utilizes a multi-year long-term planning standard, and should not be confused with the resource sufficiency tests in the EIM.[77]

Bonneville's Transmission Contracts

Position: Bonneville expects to make EIM-related changes to its Tariff to accommodate its EIM participation. For Tariff service contracts, such changes will be adopted pursuant to the statutory process. For non-Tariff service contracts, Bonneville will seek to implement these changes via mutual agreement with individual customers. Bonneville has not identified any needed modifications to such contracts at this time.

Bonneville expects to make several EIM policy decisions through iterative stakeholder processes prior to its final decision to join the EIM. As described in section III.b.4., implementation of these EIM policy decisions will require Bonneville to add certain EIM-related terms and conditions to its Tariff, business practices, and rates schedules, which Bonneville will consider pursuant to its statutory processes.[78] Any revised Tariff terms and conditions and rates adopted by the Administrator in these proceedings will apply to all of Bonneville's new and existing Tariff-service contracts.

With regard to Bonneville's non-Tariff service contracts (*e.g.*, legacy transmission service agreements), Bonneville has not identified any agreements that would be incompatible with Bonneville's participation in the EIM at this stage of analysis. However, Bonneville will continue to monitor its portfolio of transmission-related contracts through each EIM policy determination to evaluate whether any amendments are necessary and desired for those contracts. If Bonneville does determine that certain EIM-related amendments may be necessary and desired during the course of its EIM decision-making process, it will work with individual customers to pursue any such amendments by mutual agreement.

[77] The CAISO's resource sufficiency requirements are discussed in section III.e.7.
[78] Bonneville will consider EIM-related Tariff revisions in accordance with section 9 of the Tariff, which requires Bonneville to conduct a proceeding in accordance with Section 212(i)(2)(A) of the Federal Power Act and make a final determination in that proceeding. Bonneville will consider EIM-related rate revisions to transmission and ancillary and control area services rate schedules during the BP-22 rate proceeding, which is a proceeding conducted in accordance with section 7(i) of the Northwest Power Act.

BPA-2020-00784-F 0015

6. FERC Jurisdiction with Respect to Bonneville as an EIM Entity

Position: Bonneville's participation in the EIM will not change or enhance FERC's limited authority over Bonneville.

The Federal Energy Regulatory Commission (FERC) has limited authority over Bonneville's marketing activities. The Federal Power Act gives FERC general jurisdiction over the transmission of electric energy in interstate commerce and wholesale sales of electric energy in interstate commerce.[79] Though FERC has general authority to regulate public utilities engaged in interstate commerce, the Federal Power Act specifically exempts governmental entities from FERC's general jurisdiction unless the statute specifically states otherwise.[80] As a federal power marketing administration, Bonneville falls within this exemption.

The Federal Power Act does contain specific provisions that vest FERC with limited jurisdiction over Bonneville. However, neither Bonneville's agreement to participate in the EIM via contract nor the CAISO's status as a FERC-jurisdictional market can create FERC jurisdiction over Bonneville that Congress has not granted by statute. As discussed in section I.b, Bonneville's participation in the EIM would be facilitated via a series of contracts between Bonneville and the CAISO, and will include changes to both entities' Tariffs. Though Bonneville's assent to the agreements that are necessary to facilitate EIM participation may implicate FERC's limited jurisdiction over Bonneville, FERC maintains these limited authorities over Bonneville irrespective of whether Bonneville participates in the EIM. Moreover, Bonneville's voluntary participation in a FERC-jurisdictional market—the CAISO and, by extension, the EIM—would not alter the scope of FERC's authority over Bonneville.[81]

Because the EIM is a FERC-jurisdictional market, the CAISO must file and seek FERC approval of its Tariff, rates, and certain contracts under sections 205 and 206 of the Federal Power Act.[82] These provisions would also capture the contracts that the CAISO and Bonneville will enter into to facilitate Bonneville's participation in the EIM. It is possible

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[79] 16 U.S.C. § 824(b)(1).

[80] Section 201(f) of the FPA largely exempts Bonneville from regulation under the FPA because Bonneville is an "agency, authority, or instrumentality" of the United States. Section 201(f) states: "No provision in this subchapter shall apply to, or be deemed to include, the United States . . . or any agency, authority, or instrumentality of any one or more of the foregoing . . . unless such provision makes specific reference thereto." 16 U.S.C § 824(f).

[81] *Bonneville Power Admin. v. FERC*, 422 F.3d 908, 924 (9th Cir. 2005) (The court made clear that FERC cannot expand its statutory authority over an entity based on that entity's voluntary participation in FERC-approved markets.).

[82] 16 U.S.C. §§ 824d, 824e.

BPA-2020-00784-F 0015

that FERC could render a decision on a CAISO filing that Bonneville finds unacceptable. For example, the CAISO could propose, and FERC could approve, a change to its Tariff or rates that is incompatible with Bonneville's statutory directives or strategic goals. If this occurs, Bonneville could remedy the situation by ceasing to participate in the market until the issue is satisfactorily resolved or it may exercise its right to withdraw from the EIM. The EIM is a voluntary market in which members have the unqualified right to withdraw without an exit fee.[83]

7. Market Oversight Under the CAISO Tariff

Position: Joining the EIM would require Bonneville to agree to contractual provisions giving the CAISO certain market oversight and enforcement authority, but Bonneville would retain the autonomy to meet its statutory obligations.

Introduction

Bonneville has considered the effect of granting the CAISO—a nonprofit public benefit corporation organized under and pursuant to California state law—certain oversight and enforcement authority over Bonneville's participation in the EIM. As a general premise, voluntarily submitting to the authorities, oversight, and the potential for sanctions and penalties within the CAISO Tariff does not infringe on Bonneville's authority. Bonneville's participation is voluntary. If Bonneville chooses to participate, then it will be subject to the conditions of participation.

More specifically, under the CAISO Tariff, EIM participants agree to certain oversight by the CAISO Board of Governors and the EIM Governing Body, the market monitoring rules administered by the Department of Market Monitoring (DMM), and recommendations to the CAISO CEO and Board of Governors by the Market Surveillance Committee (MSC). EIM participants must comply with section 29 of the CAISO Tariff,[84] which includes rules of conduct,[85] market power mitigation procedures,[86] and other market monitoring authorities.[87] Nonetheless, Bonneville retains the flexibility to determine how its resources will participate during each interval, the ability to withdraw entirely from the EIM, and the right to appeal the CAISO's decisions. These areas are addressed below.

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[83] See EIM Charter § 2.1, which permits EIM Entities to withdraw from the EIM prior to any action that would cause or create an exit fee.
[84] CAISO Tariff § 29.1(b).
[85] *Id.* at § 29.37.
[86] *Id.* at § 29.39.
[87] *Id.* at § 29.38.

BPA-2020-00784-F 0015

CAISO Tariff Oversight and Enforcement Provisions

Rules of Conduct

All EIM participants are subject to the CAISO's Rules of Conduct.[88] The Rules of Conduct establish expected market behavior for participants, provide sanctions for violations, and delineate whether the CAISO or FERC administers certain rules.[89]

The CAISO administers rules regarding reporting generator availability, gaining approval for generator outages, providing accurate and timely settlement data, and providing accurate and timely responses to the CAISO's investigations and audits.[90] The CAISO may impose monetary sanctions for violations of these rules, ranging from $500 to $10,000 per violation. These sanctions vary depending on the duration, severity, and frequency of violations. EIM participants that object to the CAISO's investigations or determinations retain the right to seek review with FERC.[91]

FERC administers the rule regarding EIM participants submitting bids "from resources that are reasonably expected to be available and capable of performing at the levels specified in the [b]id."[92] The DMM reports suspected violations of this rule directly to FERC.[93]

Bonneville has reviewed the Rules of Conduct and generally agrees that they represent conduct that Bonneville would want other participants to abide by. If Bonneville disagreed with how the CAISO chose to apply its authority, Bonneville could seek review with FERC.

Market Power Mitigation

The CAISO monitors the EIM in real-time to identify and prospectively mitigate market conduct that can cause non-competitive constraints.[94] The CAISO will (1) apply real-time market power mitigation procedures to the EIM, including transfer constraints into an EIM Entity balancing authority area; (2) conduct competitive path assessments for each EIM Entity balancing authority area; (3) perform locational marginal price decomposition for

[88] *Id.* at § 29.37. Note that certain rules of conduct related to Operating Instructions are inapplicable to EIM participants. *Id.* at § 37.2.
[89] *Id.* at § 37.
[90] *Id.* at § 37.1.5.
[91] *Id.* at §§ 37.6.4, 37.8.10.
[92] *Id.* at §§ 37.1.5, 37.3.1.1.
[93] *Id.* at § 37.8.2.
[94] *Id.* at § 39.1.

BPA-2020-00784-F 0015

each EIM Entity balancing authority area; and (4) determine default energy bids for EIM Participating Resources.[95]

Ahead of each interval, the CAISO conducts transmission path assessments for each EIM Entity balancing authority area to determine whether a path is competitive or non-competitive.[96] If the CAISO finds that a transmission path is non-competitive, it will employ local market power mitigation to relieve the identified constraint. Any resource dispatched to relieve congestion on a non-competitive path is subject to the CAISO's market mitigation procedures.[97] Mitigated resources will receive the higher of either: (1) a CAISO-determined "default energy bid," which is generally pegged to a cost- or market-based reference level; or (2) a competitive proxy price, which is an estimate of what the price would be in the absence of the non-competitive constraint.[98] The CAISO may also report an EIM participant to FERC as part of its market power mitigation procedures.[99]

As explained in section III.e.5, Bonneville has reviewed the CAISO Tariff's market power mitigation procedures and has been actively involved in the CAISO's development of a fourth default energy bid that recognizes the unique characteristics of hydro generating resources. Adding the fourth default energy bid criteria to the CAISO Tariff should alleviate Bonneville concerns regarding market power mitigation.

Other Market Oversight

The DMM is an independent market monitoring unit, as required in all organized markets.[100] The DMM identifies and advises the CAISO Board of Governors on market design flaws, potential market rule violations, and market power abuses.[101] The CAISO's definition of market violations is broad, including a CAISO Tariff violation; a violation of a FERC-approved order, rule, or regulation; market manipulation; or inappropriate dispatch that creates substantial concerns regarding unnecessary market inefficiencies.[102] If the DMM identifies a violation, it will refer alleged market violations to the CAISO or directly to FERC, depending on the nature of the violation.

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[95] *Id.* at § 29.39.
[96] *Id.* at § 39.7.2.
[97] Price Formation in Organized Wholesale Electricity Markets: Staff Analysis of Energy Offer Mitigation in RTO and ISO Markets, FERC, § 3.3 (Oct. 2014), *available at* https://www.ferc.gov/legal/staff-reports/2014/AD14-14-mitigation-rto-iso-markets.pdf.
[98] CAISO Tariff § 39.7.1.
[99] *E.g., id.* at § 39.4.
[100] *See Wholesale Competition in Regions in Organized Electric Markets,* Order No. 719, 7 FERC Stats. & Regs. ¶ 31,281, at P 326 (2008).
[101] CAISO Tariff § 29.38 and Appendix P § 1.
[102] *Id.* at Appendix A.

BPA-2020-00784-F 0015

The CAISO Tariff also establishes the Market Surveillance Committee (MSC) to provide market design and monitoring advice to the CAISO.[103] The MSC submits recommendations directly to the CAISO CEO and the Board of Governors based on data collected by the CAISO and the DMM. Unlike the DMM, the MSC is comprised of external members and operates independently from the CAISO. The CAISO is required to publish MSC reports and recommendations upon the MSC's request. Further, the Tariff requires the MSC to review and comment on DMM analyses and reports.[104] The MSC can recommend that the CAISO impose sanctions and penalties for Tariff violations, but has no authority to impose punitive measures itself.

In addition, if the CAISO identifies potential market abuses that are outside of the market power mitigation procedures in section 39 of its Tariff, the CAISO can make a Section 205 filing under the Federal Power Act[105] to petition FERC for authorization to apply appropriate mitigation measures.[106]

While Bonneville could be subject to these investigations, Bonneville supports independent entities with specific expertise reviewing market activity and looking for potential improvements. These provisions protect Bonneville by identifying and resolving potential bad behavior by other EIM entities. The CAISO Tariff does not give the DMM, the MSC, or the CAISO the ability to direct Bonneville's operations. Instead, they seek to ensure that the market functions properly and that all market participants follow the conditions of participation.

Conclusion

Bonneville would be subject to the terms of the CAISO Tariff applicable to the EIM and its associated market rules, if it joined the EIM. These provisions are reasonable to ensure the market functions properly. These provisions would not undermine Bonneville's ability to meet its statutory obligations, including its ability to operate its system to meet non-power requirements. Existing EIM rules do not require participants to bid a specified amount of generation into the EIM, nor does the CAISO assume control of the participants' transmission systems to facilitate EIM transfers.[107] Instead, the EIM depends on voluntary bids and the transmission capacity that participants make available to the market. This preserves Bonneville's autonomy over how it sells power and provides transmission service under its statutes. Further, Bonneville would retain the ability to withdraw from

[103] *Id.* at Appendix O.
[104] *Id.* at Appendix O § 5.
[105] 16 U.S.C. § 824d.
[106] CAISO Tariff § 39.1.
[107] *See* section III.b.1 for further discussion on Bonneville's authority to sell power into the EIM.

BPA-2020-00784-F 0015

the EIM. Under Section 2.1 of the EIM Charter, the EIM Governing Body cannot impose a penalty or exit fee on participants that choose to withdraw from the EIM without first providing notice to participants and allowing them to exit. Voluntary participation is fundamental to Bonneville's ability to join the EIM.

8. EIM Governance

Position: Bonneville can participate in the EIM under the current governance structure, but there may be an opportunity to improve the structure.

The current governance structure of the EIM does not present a barrier to Bonneville's participation in the EIM. However, Bonneville believes that the structure can be improved. The CAISO has initiated a public stakeholder process to review the EIM governance structure. Bonneville is actively participating in this process and will continue to advocate for a more diverse, independent, and durable EIM governance structure. Moreover, Bonneville will evaluate any future EIM governance proposals to ensure they accommodate Bonneville's status as a federal power marketing administration and do not interfere with its ability to perform its statutory and contractual obligations.

EIM Governance Framework

Pursuant to Article IV of the CAISO bylaws, the CAISO Board of Governors[108] constituted the EIM through a foundational charter, which establishes the EIM Governing Body, its responsibilities, and procedures.[109] In general, the Charter for Energy Imbalance Market Governance (EIM Charter) lays the framework for EIM governance and tasks the EIM Governing Body with promoting, protecting, and expanding the EIM. All new EIM Governing Body members are selected by the EIM Nominating Committee—comprised of representatives from various stakeholder sectors within the EIM footprint—and approved by the existing EIM Governing Body.[110] All EIM Governing Body members must be independent of CAISO market participants and stakeholders.[111]

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[108] The CAISO Board of Governors is responsible for designing and overseeing the CAISO-controlled grid. The California governor appoints and the senate confirms each board member. Amended & Restated Bylaws of CAISO, § 4.1 (Dec. 18, 2015), *available at* http://www.caiso.com/Documents/ISOCorporateBylaws_amendedandrestated_.pdf (CAISO Bylaws).
[109] *See* CAISO Bylaws, Art. IV (establishing the EIM Governing Body).
[110] EIM Charter § 1.2; *see also* Selection Policy for the EIM Governing Board Selection Policy, CAISO (rev. Nov. 28, 2016), *available at* https://www.westerneim.com/Documents/SelectionPolicy_EIMGoverningBody.pdf.
[111] EIM Charter § 1.1.2.

BPA-2020-00784-F 0015

EIM Policy Decision-making

The EIM Charter delegates decisional authority to the EIM Governing Body over certain real-time market rules and limits the authority of the CAISO Board of Governors over such rules. As discussed in section I.b, the EIM Charter delineates the scope of this authority based on whether the real-time market rule is EIM-specific or broadly applicable to all CAISO market participants. Specifically, the EIM Governing body has primary authority over all market rules that apply uniquely to EIM balancing authority areas.[112] The EIM Charter also limits the CAISO Board of Governors' authority to enact market rule changes that are within the EIM Governing Body's primary authority by requiring prior approval of such changes by the EIM Governing Body.[113] The CAISO Board of Governors retains authority over all other real-time market rules, but the EIM Governing Body is authorized to provide formal input to the CAISO Board of Governors on those matters.[114] With respect to substantive changes to the EIM Charter, the CAISO Board of Governors may only approve such changes after they are first presented to the EIM Governing Body for advisory input.[115]

Ideally, the EIM governance would be completely independent from the CAISO Board of Governors, which are appointed by the Governor of California, but Bonneville does not see the current EIM policy decision-making paradigm as a barrier to its participation in the EIM. As described in section III.a.3, the EIM is a voluntary market. The EIM does not alter Bonneville's decision-making authority over the dispatch of generation or the operation of the federal transmission system. Moreover, EIM entities also retain unqualified withdrawal rights. If the EIM Governing Body and the CAISO Board of Governors approved an EIM market rule change that interfered with Bonneville's ability to meet its statutory or contractual obligations, Bonneville could cease its participation in the EIM until the matter is satisfactorily resolved or exit the market entirely.

EIM Governance Review

Section 2.2.4 of the EIM Charter directs the EIM Governing Body to initiate a public process to re-evaluate the current EIM governance structure no later than September 2020.[116] This

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[112] *See also* Guidance for Handling Policy Initiatives within the Decisional Authority or Advisory Role of the EIM Governing Body, CAISO (rev. Mar. 27, 2019), *available at* https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf.
[113] EIM Charter § 2.2.
[114] *Id.*
[115] *Id.* at § 8.
[116] *Id.* at § 2.2.4.

BPA-2020-00784-F 0015

re-evaluation of the EIM is currently underway.[117] As noted in section I.b, the CAISO's most recent proposals call for the establishment of a stakeholder-comprised committee to develop a governance proposal(s) through an iterative public process, which would then be presented to the EIM Governing Body and CAISO Board of Governors for approval.[118] Bonneville has actively engaged in each successive public stakeholder process since the EIM Governing Body initiated its EIM governance review process. Bonneville plans to continue monitoring and participating in this initiative as it moves forward to ensure any future revisions to the EIM governance structure continue to respect Bonneville's federal status and do not interfere with Bonneville's ability to meet its contractual and statutory obligations.

c. Environmental Obligations

Proposal: Based on its most current assessment, Bonneville believes signing the Implementation Agreement is likely the type of action typically excluded from further NEPA review pursuant to U.S. Department of Energy NEPA regulations, which apply to Bonneville. Bonneville solicits comments from stakeholders on this proposal.

Bonneville's role is to market and transmit the power generated by the Federal Columbia River Power System (FCRPS) projects in accordance with Bonneville's statutory directives to meet power customer loads and provide an adequate, efficient, economical, and reliable power supply. The FCRPS operations are managed with other project purposes and system-wide operating constraints, including operations to support Endangered Species Act (ESA)-listed fish. Bonneville's power marketing services and activities, and its actual power operations to meet load obligations, are conducted consistent with applicable Biological Opinions and are within existing operating constraints and normal operating limits of FCRPS projects.

Bonneville is considering the potential environmental effects that could result from its proposal to enter into the EIM Implementation Agreement, consistent with the National Environmental Policy Act (NEPA). Based on its most current assessment, Bonneville believes this proposal is likely the type of action typically excluded from further NEPA review pursuant to U.S. Department of Energy NEPA regulations, which apply to Bonneville. Nonetheless, Bonneville is still assessing the proposal and, depending upon the ongoing environmental review, may instead issue another appropriate NEPA document.

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[117] *See* EIM Governance Review: Issue Paper and Straw Proposal, CAISO (Dec. 14, 2018), *available at* https://www.westerneim.com/Documents/IssuePaperandStrawProposal-EIMGovernanceReview.pdf.
[118] *See* EIM Governance Review: Draft Final Proposal for Formation of an EIM Governance Review Committee, CAISO (May 21, 2019), *available at* https://www.westerneim.com/Documents/StrawProposal-EnergyImbalanceMarketGovernanceReviewCommitteeFormation.pdf.

Bonneville will complete its NEPA process and issue its NEPA documentation for this proposal prior to Bonneville issuing its Record of Decision for the proposal.

All public comments concerning NEPA compliance and/or potential environmental effects for this proposal that Bonneville received during the stakeholder discussions are being reviewed as part of this NEPA process.[119] Bonneville also will consider any public comments received on this topic as part of the 30-day public comment period associated with this Proposal.

d. Business Case for Joining the EIM

Position: Bonneville's proposal to join the EIM is a sound business decision. Bonneville expects that joining the EIM will produce both net quantitative benefits and qualitative benefits. The quantitative benefits include positive additional net annual revenue of $29-34 million. By joining the EIM Bonneville also expects numerous transmission benefits that would be difficult or costly to realize on their own. The EIM is able to provide compelling operational and commercial benefits that will enhance Bonneville's ability to more efficiently and effectively manage the FCRTS.

1. Background and Context

Since the beginning of the EIM in 2014, the CAISO has published quarterly benefit reports outlining the benefits of the EIM.[120] As of April, 2019, the reported collective gross benefits of the EIM exceeded $650 million in savings to regional EIM Entities.[121]

Bonneville recognizes that its position in the EIM will be unique. Bonneville brings to the EIM different legal mandates, a large transmission system, and a system mix almost exclusively reliant on hydro-electric power. Bonneville also acknowledges that these reports do not include the costs of joining the EIM.

To evaluate the business case of joining the EIM, Bonneville developed a cost-benefit analysis (C/B Analysis), that considers qualitative benefits and compares estimated startup and annual costs to expected annual benefits. For qualitative benefits, Bonneville considered the operational benefits of the EIM. These benefits primarily inure to the transmission system, with better congestion management, improved controls, greater state awareness, and better modeling and coordination. The C/B Analysis, which Bonneville

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[119] No NEPA-related comments have been received to date.
[120] *See* Western Energy Imbalance Market, *available at* https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx.
[121] *Id.; supra* section I.a.

developed with input from regional stakeholders, is provided in Attachment B to this letter. A summary of the C/B Analysis and Bonneville's findings is provided in section III.d.2 below.

Bonneville presented its initial findings at a stakeholder meeting on May 15, 2019.[122] On June 12, 2019, Bonneville presented updated analysis to stakeholders at a public meeting in response to stakeholder feedback requesting additional scenario analysis.[123]

2. Costs and Benefits Analysis Summary

i. Costs of Joining the EIM

Joining the EIM will result in changes to the internal operations and systems for Bonneville's Power Services and Transmission Services. Because these changes are expected to occur across the business lines, Bonneville approached the cost element of the Cost Benefit Analysis from a "One BPA" method and did not attempt to assign costs to a particular business line. To assist in developing estimates for the costs of joining the EIM, Bonneville engaged Utilicast, a consulting services firm that specializes in the energy and utilities industry. Utilicast provided Bonneville estimates for a variety of Grid Modernization projects in 2017. After determining which projects were essential for EIM participation, Bonneville reviewed and updated Utilicast's estimates to incorporate Bonneville's EIM-related knowledge. Additionally, Bonneville internally estimated ongoing costs associated with Bonneville participation.

Start-Up Costs

Start-up costs are the costs that Bonneville expects to incur in the initial period leading up to and just after joining the EIM.

As noted earlier, Bonneville is in the process of modernizing the federal power and transmission systems. Many of the upgrades and system improvement needed for that effort also support the technological or operational requirements for joining the EIM. To isolate the incremental costs of joining the EIM, Bonneville focused its cost analysis on spending that Bonneville would only undertake if Bonneville were to join the EIM. Bonneville determined the "EIM Incremental" nature of each project and made updates to initial Utilicast cost estimates where appropriate. These costs generally fall into three

[122] Materials from the meeting are available at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190515-May-15-2019-EIM-Stakeholder-Mtg.pdf.
[123] Materials from the meeting are available at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190612-June-12-2019-EIM-Stakeholder-Mtg.pdf.

BPA-2020-00784-F 0015

broad groups: infrastructure (*e.g.*, metering and AGC modernization), operations (*e.g.*, base schedule submission and bid curve development), and after-the-fact (*e.g.*, settlements). Infrastructure costs are provided as a range to reflect the uncertainty around the need for metering interchange upgrades.

Bonneville's estimated startup costs, including labor and non-labor costs, are as follows:

Startup Costs ($M)

EIM Category	Cost* ($M)	Labor	Non-Labor
Infrastructure (Metering & AGC Modernization)	$7.9-$13.3	$2.7-$8.1	$5.3
Operation (EIM Integrator, Schedule Submission, & Bid Curves)	$17.2	$9.8	$7.4
After-the-Fact (Settlements)	$4.6	$3.6	$1.0
Total	**$29.7-$35.1**	**$16.1-$21.5**	**$13.7**

Bonneville's startup costs are higher than many other entities' startup costs but commensurate with Bonneville's relative size, complexity, and existing infrastructure. It is also important to note that a portion of Bonneville's labor costs included in the startup cost estimate are not expected to be incremental to Bonneville as a whole. CAISO implementation fees of $1.8 million are included in startup costs.

On-Going Costs

If Bonneville joins the EIM, Bonneville would also experience certain on-going costs. The estimates of the on-going EIM costs have evolved as Bonneville has increased its understanding of the EIM. Bonneville subdivided on-going costs into the same three categories as the start-up costs: infrastructure, operations, and after-the-fact. There are no ongoing costs categorized as Infrastructure because expected O&M for new systems is categorized as Operation. Operational costs include estimates of the annual internal costs to perform EIM-related functions, such as creating and submitting resource plans, staffing and developing a new EIM desk, maintaining Information Technology (IT) systems, and the costs of CAISO fees related to EIM participation. After-the-fact costs include costs of maintaining more settlements staff.

BPA-2020-00784-F 0015

The estimated on-going costs of the EIM are as follows:

Ongoing Costs ($M/yr)

EIM Category	Cost* ($M)
Infrastructure	$0.0
Operation (Resource Plans, EIM Desk, IT O&M, CAISO Fees)	$5.7
After-the-Fact (Settlements Staff)	$1.2
Total	**$6.9**

ii. Benefits of Joining the EIM

Overview of the Dispatch Benefit of the EIM

One of the primary benefits the EIM provides to participating entities is the functionality of dispatching generation economically. Consistent with the generator's bids and transmission constraints, the EIM provides a signal to Participating Resources to increase or decrease generation when it is economic. In this way, resources participating in the EIM are likely run by owner/operators as follows: generation increases when doing so will make more revenue for that resource, and generation decreases when it would save that resource money. This feature of the EIM is generally referred to as the "dispatch benefit."

Methodology for Determining the Dispatch Benefit

To estimate the dispatch benefits of joining the EIM, Bonneville contracted with E3, an industry-recognized expert energy consulting firm that performed EIM benefits analyses for many other current or prospective EIM participants. E3 used a PLEXOS modeling approach, which simulates day-ahead and hour-ahead dispatch, along with both the fifteen-minute and five-minute dispatches of the EIM, and explicitly quantifies the incremental dispatch benefits of EIM participation.

Using the PLEXOS model, E3 simulated dispatches of the FCRPS within Bonneville's balancing authority area under two scenarios: (1) a "Business as usual" case (BAU); and (2) an EIM case. E3 used historical data from 2016-2018, including generation and generation forecasts, load and load forecasts, interchange, and price data.

Assumptions Used in Determining Dispatch Benefit

The federal power system is unique in many respects, with specific environmental, statutory, and operational restrictions limiting its flexibility. To ensure that E3's analysis

reflected feasible dispatches by the federal system, Bonneville provided a list of parameters that had to be maintained when E3 performed its analysis. Briefly, these parameters were:

1. 24-hour energy neutrality[124] relative to historical actual generation to avoid river management issues
2. System feasible min/max limits calculated by the Slice Computer Application
3. Net of regulation, EIM-dispatchable capacity limited to available INC/DEC spin capacity at Big 10 projects (to eliminate simulated unit starts/stops)
4. All other generation in Bonneville's balancing authority area is held constant in both the BAU case and the EIM case
5. Bonneville estimated Resource Sufficiency requirements

In addition, Bonneville performed additional verifications of E3's proposed dispatches to ensure that the study produced dispatches of federal generation that were feasible. Bonneville evaluated and modified the E3's study for the following:

1. Verified model compliance with all constraints
2. Reviewed simulated dispatch to ensure reasonableness
3. Verified simulated EIM net sales positions are within available transmission expectations
4. Reviewed initial sensitivities (50% volatility & no CA deliveries) and resulting effects
5. Confirmed that historical spin capability was sufficient to pass EIM RS requirements the vast majority of the time
6. 75% success rate applied to offset perfect foresight.[125]

Scenarios

Bonneville presented its initial findings at the May 15, 2019, stakeholder meeting. Subsequently, stakeholders requested that Bonneville perform additional analysis using different pricing assumptions. Bonneville agreed to perform additional analyses and engaged E3 to simulate Bonneville's benefits using individual pricing node scenarios. Bonneville selected the price nodes at PacifiCorp West (PACW), Puget Sound Energy (PSEI), and Portland General Electric (PGE). These price nodes display price levels and volatility

[124] In this context, energy neutrality means the same level of generation over the course of a 24-hour period in both cases.

[125] The E3 study produced results that assumed Bonneville had perfect market foresight (Bonneville bid range perfectly matched prices). Bonneville discounted E3's results by 25% to reflect Bonneville having imperfect knowledge of prices and thus only receiving the dispatch benefits of the EIM 75% of the time. This is not treated as a constraint, because it was an adjustment to benefits after the model completed its simulation.

BPA-2020-00784-F 0015

experienced by actual Northwest EIM participants. Bonneville has determined that the revenue simulations using these price nodes better reflect the dispatch benefits of participating in the EIM. The resulting estimated gross benefits are summarized below.

Sensitivity Analysis

In order to test the robustness of this quantitative dispatch benefits range, Bonneville requested E3 to run its analysis using additional sensitivities based on the midpoint of scenario results (PGE or NW Midpoint/Base).

1. 50% Volatility: A reduction in market volatility that assumes lower intra-hour price volatility by 50%;[126]

2. GHG Cost Avoidance: To reflect no direct California deliveries, and avoid the GHG compliance fee, E3 modeled Bonneville receiving lower LMP when selling during intervals where marginal GHG component is nonzero;[127]

3. Flexible Ramp Sufficiency Test (FRST) Only: To reflect minimal EIM participation, E3's modeling limited Bonneville's participation to only what is necessary to meet estimated resource sufficiency requirements, based on FRST requirements, not including diversity benefit; and

4. Higher Success Rate (90%): To reflect improved foresight on market conditions, hydro constraints, operations, and success in being awarded bids at modeled price.

Summary of Dispatch Benefits

The table below shows E3's estimation of the dispatch benefit to Bonneville of joining the EIM. This table reflects the annual incremental revenue Bonneville would have received above the "business as usual" case had the EIM been in place under the operational and hydrological conditions that existed during the 2016 through 2018 period.

[126] A larger number of EIM participants bringing both supply and demand to the market is expected to reduce observed volatility in EIM prices. A 50% reduction is not a forecast, but a scenario meant to incorporate potential lower volatility in the future.
[127] Bonneville does not currently have a procedure in place to allow delivery to CA in an EIM construct due to its inability to pay a GHG compliance fee. This scenario reflects lower market benefits associated with preventing delivery to CA. The carbon issue is explained in section III.e.4 of this document.

BPA-2020-00784-F 0015

Gross EIM Benefits ($M/yr)

	Estimated Gross Revenue
Range of Gross Dispatch Benefits	**$36-40**
PSEI Price	$36.1
PACW Price	$40.4
PGE Price (NW Midpoint/Base)	$39.2

Gross EIM Benefits Sensitivities ($M/yr)

Reduced Volatility	$35.3
GHG Compliance	$34.6
FRST-Only Participation	$24.4
Higher Success Rate	$47.1

iii. Net Benefit of Joining the EIM

Comparing the costs of joining EIM with the modeled net dispatch benefits indicates significant *annual* net financial benefits to Bonneville if it participates in the EIM.

Net EIM Benefits ($M/yr)

	Estimated Net Revenue
PSEI Price	$29.2
PGE Price	$32.3
PACW Price	$33.5

Bonneville recognizes that the annual net EIM Benefits do not account for startup costs, as discussed above.

E3 modeling, paired with estimates of startup and ongoing costs, suggests that EIM participation would quickly pay for itself based solely on dispatch benefits. The sensitivities that were evaluated did not fundamentally change this conclusion.

The results of Bonneville's benefits analysis are set forth in Attachment B. Comments on these results should be made in response to this Proposal.

BPA-2020-00784-F 0015

iv. Transmission Benefits

Background and Context

The EIM not only produces the most economical dispatch of voluntarily offered resources to serve load and imbalance across the entire EIM footprint,[128] it does so while simultaneously honoring all modeled constraints.[129] The EIM models numerous constraints, including transmission operating limits, balancing authority area power balance, interchange transfer limits, ramp rates of resources, minimum and maximum resource generation limits, and many others that are too numerous to list here.

The EIM produces 15-minute solutions for up to the next two hours and 5-minute solutions for up to the next hour based on a large set of input data. This includes a full state-estimated network model of the Western Interconnection, planned and forced outages, load forecasts, variable energy forecasts, economic resource offers, transmission limits, generation limits, and generation ramp rates, among many other data inputs. As such, the EIM is able to respond to not only real-time conditions but also predict future needs and operating conditions in advance.

Qualitative Transmission Benefits

The EIM can provide numerous qualitative benefits due to how the EIM works, the large amount of data it requires, and the information that it produces. Qualitative benefits categories include improved control, improved state awareness, modelling and coordination, and transmission investment decisions. Below, each category of qualitative benefits is described in more detail.

Improved Controls:

- Proactive congestion management – Transmission constraints modelled and enforced in the EIM will identify congestion before it arises and dispatch least cost resources to stay within operating limits.
- Reactive congestion management – The EIM can resolve congestion that occurs in real-time or is the result of an unplanned or forced outage within one or two 5-minute market intervals.

[128] The EIM footprint (a.k.a. EIM Area) includes all participating balancing authority areas plus the CAISO.
[129] The EIM is said to be "Security Constrained" in that it honors modeled constraints in the process of producing the most economical solution to serve load and imbalance. The combination of the economic dispatch and the security-constrained nature of the EIM are often referred to as Security-Constrained Economic Dispatch (SCED).

BPA-2020-00784-F 0015

- Proactive voltage control – The Rate of Change constraint, which helps ensure the EIM does not adversely impact voltage, would likely be more effective by including incremental dispatches from Bonneville area resources.
- Higher Transmission Utilization – With the more advanced, responsive, and foreword looking congestion management capabilities of the market, there is the potential to more fully utilize existing transmission assets.

Improved State Awareness:

- Situational awareness - Leveraging the increased and more accurate data the EIM provides will allow Bonneville to create new and improved state awareness displays, allowing operators to better predict emerging operational issues.
- Access to CAISO EIM Dispatcher tools – the CAISO's Automated Dispatch System and Balancing Authority Area Operations tool will allow Bonneville Transmission to review dispatches, ensure dispatch accuracy, view Adjusted Net Scheduled Interchange, have Manual Dispatch functionality, view resource deviations, and view Bonneville binding transmission constraints.

Modeling and Coordination:

- Improved network modeling – Results in improved sharing and fidelity of critical reliability data and models.
- Improved outage coordination – Reduces the communication and coordination latency of outage information, which can result in temporary differences in modeled outages.
- Improved Power & Transmission coordination – More so than today, participating in the EIM requires tighter and more effective coordination of resource capabilities to ensure that Resource Sufficiency (RS) tests are passed and that Bonneville has reliable and economic outcomes.

Transmission Investment Decisions

The congestion management features of the EIM are expected to be more economically efficient, precise, and effective than present curtailment and bilateral redispatch capabilities. Further, through the congestion component of LMPs, over time the EIM can also help identify areas of the system that might benefit from transmission investments. This should create new opportunities for optimizing transmission expansion investment decisions as well as improve day-to-day operation of the power system. The types of projects that the EIM could help defer or avoid are the transmission expansion projects that are driven by network congestion that could be remediated with security-constrained

BPA-2020-00784-F 0015

economic dispatch. These include potentially capital intensive projects like the I-5 Corridor Reinforcement that target network flowgates with dispatchable generation on both sides. The deferral or avoidance of such projects can result in significant long-term cost savings to Bonneville transmission customers.

There are some other categories of capital projects that are driven by other needs that the EIM would not be expected to displace, such as:

- Sustain Program - These projects are needed to ensure continued safe and reliable operation of existing facilities, such as replacement of wood poles or transformers that have reached their end of life use.
- Generation Interconnection, Line & Load Interconnection - These Expansion Program projects are driven by requests from customers that need new access to the grid, such as new wind generators or data center loads.
- Load Service Area reinforcements - These projects are required to mitigate reliability criteria violations that could lead to load loss following outages. Often there is little or no additional resource capacity to increment within the load pockets during peak load conditions. An example is the Hooper Springs project in southeast Idaho.

Transmission Curtailments

When Bonneville determines that transmission flow relief is necessary to maintain system reliability, Bonneville may curtail transmission schedules pro-rata according to NERC Curtailment priority. Curtailments are non-optimal, as more MW of schedules typically must be curtailed to attain the desired MW of flow reductions. This inefficiency can be attributed to a number of factors such as Bonneville only being able to curtail schedules where it is the Transmission Service Provider or Transmission Operator; any potential relief is highly dependent on the source and the sink of the underlying schedules. Further, curtailments result in imbalances that need to be resolved separately by each impacted balancing authority area, often further reducing the effectiveness of curtailments, because each balancing authority area's resolution of the imbalance resulting from the curtailment is typically not informed by Bonneville's transmission constraints.

The EIM's security-constrained economic dispatch (SCED) model is able to find an optimal redispatch solution of voluntarily offered resources that can simultaneously minimize costs while taking into consideration transmission constraints and operating limits. Price signals and market dispatches incentivize effective resources to be dispatched (incremental or decremental) to manage the congestion in the most cost effective manner possible while simultaneously ensuring each EIM participating balancing authority area remains balanced.

BPA-2020-00784-F 0015

Since any effective and economic EIM Participating Resource can potentially fulfill the market dispatches, the EIM has the potential of reducing the burden on Bonneville transmission customers and reduce the likelihood of curtailments or scheduling restrictions.[130]

As an example of the ability of the EIM to provide moderate amounts of flow relief, Bonneville tested the EIM Area Total Flow (ETF) constraint that was created as part of the Bonneville-CAISO Coordinated Transmission Agreement (CTA).[131] Bonneville compared the effectiveness of the EIM to provide flow reductions versus traditional schedule curtailments. The ETF constraint was able to provide in one 5-minute market run an amount of flow relief that would have required over 1,200 MW of schedule curtailments.

EIM as a Non-Wires Solution

The EIM has characteristics that Bonneville believes could be used as a cost effective alternative for managing moderate amounts of intra-hour congestion across the transmission system. These characteristics are akin to Bonneville's use of non-wires solutions to address congestion. The characteristics of the EIM compared to demand response (DR), storage, and transmission builds are shown in the table below.

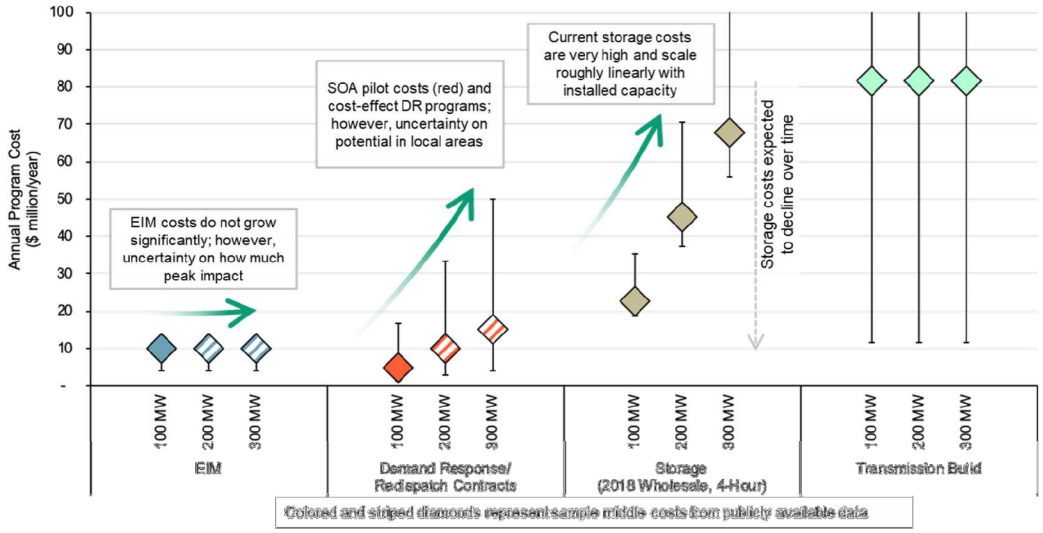
	EIM	DR	Storage	Transmission Build
Generation Capacity Value	No	Yes	Yes	No
Energy Value	Yes	Yes	Yes	No
Transmission Capacity Value	Low	Low	Medium	High
Congestion Area	Wide	Local	Local	Local
Congestion Value	High	Medium	Medium	High
Effort to Provision	Low	Medium	Medium	High
Levelized Costs	$	$$	$$$	$$
Call Option Timing	N/A	0-2 Days	0-2 Days	N/A
Response Time	8-12 Minutes	0-18 Hours	0-18 Hours	N/A
Duration	5-240 Minutes	1-360 Minutes	1-480 Minutes	30-50 Years
Uses	Load Service Imbalance Energy Economic Dispatch Congestion Management Renewable Integration Energy Optimization	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services Energy Optimization	Load Service Renewable Integration

[130] Transmission rights remain unchanged by the EIM.
[131] The CTA is available at https://www.bpa.gov/transmission/CustomerInvolvement/CoordinatedTransmissionAgreement/.

BPA-2020-00784-F 0015

Bonneville will continue to invest in transmission builds, DR, and storage as part of Bonneville's resource planning and load service strategies.[132] However, the EIM can provide Bonneville an additional tool to help manage intra-hour congestion across a wide area (*e.g.*, multiple constraints or locations) with minimal incremental costs, whereas other solutions are typically a locational solution and applicable to only portions of the system. For example, additional locational investments in DR, storage, or transmission builds would potentially be required to manage flows across multiple wide area constraints. All of these types of solutions will still be necessary if Bonneville joins the EIM, but Bonneville would be able to incorporate less expensive and simpler redispatch options in certain situations that may be very difficult or cost prohibitive for Bonneville to achieve outside of joining the EIM.

The figure below shows conceptually how the EIM costs[133] do not grow significantly as flow relief needs increase (100 MW, 200 MW, 300 MW), although uncertainty on how much flow relief is available increases with need. For illustrative comparison, utilizing DR or storage would require additional investments as more flow relief is needed or additional areas of the system need flow management.[134]



[132] The EIM does not provide any energy capacity or transmission capacity value and cannot be relied upon to meet hourly resource sufficiency or long-term resource adequacy needs. Investments in resources and transmission assets with true capacity value will still be necessary.

[133] EIM costs are illustratively shown as annual levelized program costs based on Bonneville's estimated startup and ongoing costs spread over 20 years at an 8% discount rate to be roughly $10 million/year.

[134] Comparison costs depict up-front implementation costs, not levelized or discounted over the anticipated life of the solution. Bonneville expects that the levelized costs of an ongoing DR program would be significantly less than those from the time-limited SOA pilot. While the cost of storage solutions has rapidly declined in recent years, with further cost reductions expected, figures shown here may not represent near-horizon costs for battery storage.

BPA-2020-00784-F 0015

Illustrative Quantitative Example

Accurately and objectively quantifying EIM transmission benefits is challenging given the multi-faceted nature of the EIM and that Bonneville will have many options that must be considered and evaluated when making future investments in solutions to address operational and reliability needs.[135] However, it is useful to compare an illustrative quantitative scenario made possible by joining the EIM to one or more non-wires scenarios.

Assuming two flowgates, each needing 100 MW of intra-hour flow relief, one can develop an illustrative quantitative example as follows:

- Battery and Redispatch Scenario: Assume that the relief comes from a 50/50 mix of battery storage and Redispatch contracts or DR
  - Assume Redispatch/DR costs based on South of Allston (SOA) Redispatch Pilot[136]
- EIM: Based on total levelized EIM program costs

As shown below, the annual costs would be $27.6 million/year in the Battery and Redispatch scenario and $10 million/year in the EIM case. The annual program costs for the Battery and Redispatch scenario would be expected to increase if more relief is needed or more flowgates need to be managed, whereas the EIM costs would likely not grow significantly. For example, as a sensitivity, if you changed the base scenario to 4 flowgates or 200 MW, the annual program costs would be $55.2 million/year in the Battery and Redispatch scenario and $10 million/year in the EIM case.

Battery and Redispatch Scenario		EIM Case	
100 MW battery @ $226/kW-year	$22.6 million/year	$10 million/year (levelized startup and ongoing costs)	$10 million/year
100 MW Redispatch Contract / DR @ $50/kW-year	+ $5.0 million/year		
Annual Cost	**= $27.6 million/year**		**= $10 million/year**

[135] DR, storage, and transmission builds have unique purposes and value outside of congestion management.
[136] The SOA Redispatch Pilot provided for approximately 100 MW of flow relief for 40 hours/year *(10 events, 4 hours each, weekdays afternoons only, from July-September, 2017 and 2018)* from 200 MW of incremental and 200 MW of decremental capacity with a prior to pre-schedule call-option requirement and manual deployments. A longer-term program may have been less expensive on an annual basis (*e.g.*, 5-7 years).

BPA-2020-00784-F 0015

Transmission Benefits Summary

The EIM has characteristics that Bonneville believes provide many qualitative transmission benefits and is an additional tool for Bonneville to use for grid management. Further, Bonneville's transmission customers in its balancing authority area may also benefit by being able to bid their resource flexibility into the EIM, allowing them an additional opportunity to optimize their energy dispatch and maximize the value of their resources.

The EIM not only provides the most economic dispatch solution to supply load and imbalance in the balancing authority area, it can also provide a more precise, effective, and cost efficient mechanism to manage moderate amounts of intra-hour congestion. While the EIM does not create new capacity or replace the need for investments in transmission, DR, or storage, it is a complementary low cost alternative (among other non-wires options as well as new transmission builds) for addressing modest intra-hour transmission relief needs that arise across the Bonneville system.

Comments on the transmission benefits should be made in response to this Proposal.

e. EIM Policy Proposals

As explained in section III, Bonneville is proposing decisions on several policy matters to be decided in the September 2019 ROD. These policy matters are:

1. Generation Participation Model
2. Transmission Usage – Interchange
3. System Operations Tools
4. Carbon Obligations and related considerations
5. Market Power (LMPM and DEB)
6. Load Aggregation
7. Resource Sufficiency – Balancing Authority Area Level

1. Federal Generation Participation Plan

Proposal: *Bonneville will initially participate in the EIM with federal hydroelectric dams aggregated into three resource zones comprised of the Upper Columbia dams (Grand Coulee, Chief Joseph), Lower Columbia dams (McNary, John Day, The Dalles, Bonneville), and Lower Snake dams (Lower Granite, Little Goose, Lower Monumental, Ice Harbor). These resource groups will participate in the EIM as separate aggregated Participating Resources (APR). The amount of generation produced by these resources not bid into the EIM will be treated as an aggregated non-participating resource (ANPR) for purposes of the EIM. All other federal*

BPA-2020-00784-F 0015

resources in the Bonneville balancing authority area will initially be non-participating resources in the EIM.

Background and Context

Bonneville believes the EIM will provide Bonneville with new means to mitigate transmission congestion, as well as potential new opportunities to optimize the marketing of the FCRPS by monetizing its flexibility that would otherwise go unused. This optimization occurs within security constraints which seek to prevent the market's economic dispatch from causing congestion. The EIM develops price signals that reflect the extent to which those constraints are "binding" (*i.e.*, preventing an otherwise more economic dispatch). These price signals can help incentivize more efficient and reliable operation by reflecting operations and behaviors that implicate the security constraints.

These incentives, however, are limited to the extent market participants can effectively respond to the economic dispatch. As a general matter, the more accurately the EIM can model the resource responding to the congestion, the more certainty there is that the EIM will develop the most economic redispatch to relieve the congestion. The converse of this principle is also true. The less accurately the EIM can model the resource responding to congestion, the less confidence there is that the EIM will develop the most economic redispatch to relieve congestion. This distinction becomes important in the EIM when considering how Participating Resources are aggregated into a group.

The EIM permits a Participating Resource Scheduling Coordinator (PRSC) to aggregate its Participating Resources into one or more groups.[137] The benefit to grouping Participating Resources is that it distributes the market dispatch instruction over multiple resources. For instance, assume a PRSC bids a group of four resources into the EIM (Projects W, X, Y, Z), all of which have 25 MW of capability. If the EIM orders this group to *inc* by 40 MW, the EIM would distribute that order across all the projects based on a pre-defined distribution (referred to as a "generation distribution factor" or GDF). Assuming this group's GDF was .25, each Project in the group would be responsible for providing 25% of the 40 MW dispatch instruction, or 10 MW for each project (*e.g.,* W = 10 MW, X = 10 MW, Y = 10 MW, Z = 10 MW). Bonneville refers to this model as the aggregated participating resource or APR model.

[137] *See* EIM Business Practice Manual, CAISO, § 11.3.1, *available at* https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy Imbalance Market.

The EIM also includes additional functionality that allows the PRSC to choose which resources within the group respond to a market dispatch.[138] This functionality comes through overlapping participating and non-participating resources in a group. Bonneville refers to this model as the overlapping aggregated participating and aggregated non-participating resource model or APR/ANPR model. Returning to our example, a PRSC using the APR/ANPR model could choose the distribution of the market instruction among the four projects (*e.g.*, W = 20 MW, X = 10 MW, Y = 10 MW, Z = 0 MW).

Both operating models—the APR model and APR/ANPR model—allow Bonneville to control the hydraulic impact of EIM activity on the closely linked river operations in a similar fashion to how they are managed today. That flexibility, however, comes at the cost of not fully realizing the congestion relief and congestion revenue benefits that project level participation model would provide.

If Bonneville joins the EIM, Bonneville must decide how many APR groupings Bonneville intends to use to bid federal capability into the EIM. In addition, Bonneville must also determine whether it will use the APR/ANPR functionality to choose which generators within the aggregation will respond to market dispatches.

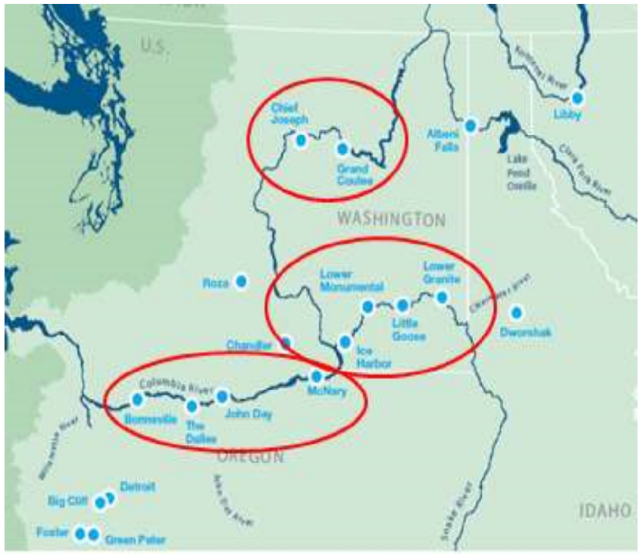
Aggregation of Federal Generation Proposal

Bonneville proposes aggregating the "Big-10" federal projects into three participating resource groups.

Upper Columbia:
- Grand Coulee (GCL)
- Chief Joseph (CHJ)

Lower Snake:
- Lower Granite (LWG)
- Little Goose (LGS)
- Lower Monumental (LMN)
- Ice Harbor (IHR)

Lower Columbia:
- McNary (MCN)
- John Day (JDA)
- The Dalles (TDA)
- Bonneville (BON)



[138] *Id.*

BPA-2020-00784-F 0015

Bonneville is proposing to only aggregate the Big-10 projects into APRs because these are the federal projects that currently have the technical controls and hydraulic capabilities best suited to respond to EIM dispatches. The other 21 federal dams do not have the same controls or flexibility as these projects.

Bonneville is proposing the three participating resource aggregation model based on several factors. First, Bonneville considered the electrical similarities of the Big-10 projects. Bonneville conducted an electrical similarity analysis to determine how a change in generation at each project affects various transmission flowgates. The analysis looked at Bonneville's internal/network flowgates and established a set of Generation Shift Factors (GSFs) for each project, assuming all transmission lines were in service. Projects that had similar GSFs were considered to be electrically similar for that flowgate.[139]

Second, the three participating resource aggregation model also appropriately captures the unique hydraulic and operational aspects of the Big-10 projects. Storage projects operating in the upper part of the Columbia River system generally have different hydrologic and operating conditions and requirements than the projects located on the lower part of the Columbia River system, and the lower Snake River projects have their own unique requirements.

Bonneville considered other participation models, including less aggregation (making the Big-10 a single APR), and more (bidding in the available capability of each project from the Big-10). The following table shows the pros/cons of each model.

[139]In the analysis, if the difference between any two GSFs were less than 10%, the resources were considered to be electrically similar. Bonneville shared the results of its electrical similarity analysis with stakeholders at the October 11, 2018 public stakeholder meeting. *See* https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20181011-October-11-2018-EIM-Stakeholder-Mtg.pdf (slides 33-36).

Participation Alternative	Pros	Cons
One Aggregate	• Most similar to the current way of optimizing the FCRPS– less implementation requirements and costs to join the EIM	• Least efficient congestion relief and optimization of FCRPS • Lack of additional revenue associated with different Locational Marginal Prices (LMP)
Three Aggregates (Proposed)	• More efficient congestion relief than One Aggregate alternative • Moderate additional revenue opportunities associated with different LMPs	• May not fully realize congestion relief and revenue benefits that Project Level alternative would provide • Will require additional implementation requirements
Project Level	• Most efficient congestion relief • Most additional revenue opportunities associated with different LMPs	• More complexity, which increases the risk that BPA may, through its bids, operate the FCRPS less efficiently. • Will require additional implementation requirements

Bonneville is proposing to use the three participating resource aggregation model because it provides an appropriate balance between capturing the congestion benefits of the EIM while maintaining Bonneville's flexibility to respond and adjust to operational circumstances unique to each of the Big-10 projects. Bonneville views the three-aggregation proposal as a "starting point" for its initial participation in the EIM. Bonneville may modify its participation model, (*e.g.,* adding APRs, removing APRs) as Bonneville gains experience and confidence in the EIM. In addition, Bonneville's proposed aggregation must be reviewed by the CAISO before Bonneville joins the EIM.[140]

Overlapping Participating and Non-Participating Aggregation

Bonneville also proposes to use the APR/ANPR overlapping aggregation model. That is, each group of Participating Resources will have an amount of generation designated as participating in the EIM and another amount designated as non-participating. The benefit to Bonneville of this paradigm is that Bonneville can apply different "generation distribution factors"[141] to the participating and non-participating portions of the grouped

[140] *See* Market Operations Business Practice Manual v.60, CAISO, §3.1.2, *available at* https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market Operations.

[141] In this context, a generation distribution factor is the percentage of an individual resource's share of the total aggregate for both the participating and non-participating portions of the aggregation. For example, for the Upper Columbia aggregation, Bonneville may designate Grand Coulee as .66 and Chief Joseph as .34 for

BPA-2020-00784-F 0015

resources. This functionality is preferable because it allows Bonneville to choose which generators respond to a market dispatch. Bifurcating the aggregations in this manner is consistent with how Bonneville operates federal resources today.

Bonneville seeks comments on its proposals for aggregation and using the APR/ANPR model.

2. Transmission Usage – Interchange

Proposal: Bonneville is proposing to adopt the Interchange Rights Holder Methodology for making transmission available to the EIM.

Overview of EIM Transfers

As part of its decision to join the EIM, Bonneville must determine how it will make transmission available for EIM Transfers. EIM Transfers represent the net transfer of energy between EIM Entity balancing authority areas. The EIM uses transmission made available for EIM Transfers to develop the optimal dispatch of generation throughout the EIM footprint. Without transmission for EIM Transfers, the EIM can only optimize the load and generation within individual EIM Entities' balancing authority areas.

Energy delivered through EIM Transfers are not specifically tied to individual generators or loads, but are modeled as an *aggregate* delivery of power between EIM Entity balancing authority areas. Further, energy delivered to an EIM Entity's balancing authority area through an EIM Transfer may not ultimately serve load within that EIM Entity's balancing authority area. Instead, that energy may be used to facilitate further EIM Transfers to other EIM Entities. Transmission used to facilitate EIM Transfers is not reserved for any individual market participant's use. Rather, the EIM uses this transmission to develop the optimal wide-area dispatch. EIM Transfers only reflect the transfer of energy between EIM Entity balancing authority areas, not the transfer or transmission of energy within an EIM Entity's balancing authority area. EIM Transfers are limited to how much transmission capacity has been made available to the EIM to facilitate the transfer of energy among EIM Entities.

There are two existing methods of making transmission available for EIM Transfers:

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the participating portion of the aggregation, and Grand Coulee as .34 and Chief Joseph as .66 for the non-participating portion of the aggregation. The overlapping aggregation and non-aggregation paradigm will allow Bonneville to manage resource dispatch as it does today.

BPA-2020-00784-F 0015

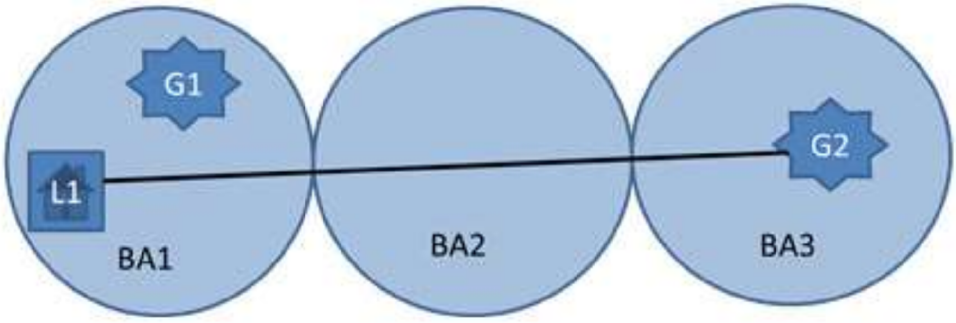
a. Direct Provision Methodology: The EIM Entity makes unscheduled transmission capacity between itself and other EIM Entities available for EIM Transfers. Such transmission capacity is non-firm and would be curtailed before all other transmission schedules at the North American Electric Reliability Corporation (NERC) curtailment priority level of 0-NX. To date, no EIM Entity is directly compensated for the transmission made available to the EIM in this way, although it may collect congestion revenue under certain circumstances.

b. Interchange Rights Holder Methodology: A transmission customer with long-term firm Point-to-Point transmission service between two EIM Entities (*i.e.*, an Interchange Rights Holder) may "donate" all or a portion of that long-term firm PTP transmission service to the EIM to facilitate EIM Transfers at the continuing discretion of the transmission rights holder. The transmission customer continues to pay the EIM Entity the applicable rate for long-term firm PTP transmission service, and the customer may collect congestion revenue under certain circumstances.

Bonneville's Proposal for EIM Transmission – Interchange Rights Holder Methodology

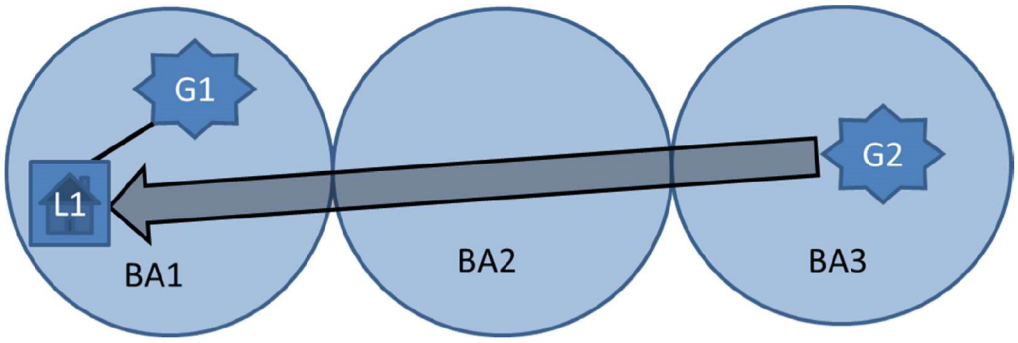
Bonneville is proposing to adopt the Interchange Rights Holder Methodology. Given the size and the position of the FCRTS, Bonneville expects to be a significant "net wheeler" in the EIM. In other words, Bonneville expects that a significant amount of EIM Transfers will originate in one EIM Entity's balancing authority area, be "wheeled" or transferred through the FCRTS, and ultimately serve load in another EIM Entity's balancing authority area. Under these circumstances, Bonneville believes the Interchange Rights Holder Methodology better balances the need to provide transmission to the EIM with collecting enough revenue to adequately and fairly recover the costs of the FCRTS. Under the Direct Provision Methodology, an EIM Entity does not receive compensation for the transmission it makes available to the market. On the other hand, the Interchange Rights Holder Methodology ensures that Bonneville is compensated for the transmission service provided to the EIM. This methodology gives an interchange rights holder the ability to choose how to best use their transmission service. See the figures below for a demonstration of net-wheeling.

BPA-2020-00784-F 0015



Example 1: Absent the EIM – Currently, Transmission Is Purchased Across Each Balancing Authority Area

Load L1 purchases and schedules transmission across BA1, BA2, and BA3 in order to access the cheaper generation G2. G1, a high cost generator, is dispatched to supply balancing in BA1.



Example 2: With the Direct Provision Methodology – Unrecovered Costs

Load L1 purchases transmission in BA1, and schedules from generator G1, a high cost generator thus satisfying its resource sufficiency requirement. However, in operations, the EIM dispatches the cheaper generation G2 to serve L1, using uncompensated transmission across BA2.

The Interchange Rights Holder Methodology is consistent FERC precedent

The Interchange Rights Holder methodology is established and tested in the EIM. In fact, the first EIM Transfers were made available in this manner on the Northwest AC Intertie for transfers between PACW and the CAISO. This method has been developed and established when there are multiple transmission owners and operators of transmission

paths. FERC has accepted Tariff provisions from multiple EIM Entities for the provision of EIM Transfer transmission via the Interchange Rights Holder methodology.[142] Further, since it has been in wide use throughout the Pacific Northwest over the last few years, it has been proven to provide sufficient transmission for the proper functioning of the EIM as it is designed today.[143] As the EIM and other markets evolve in the West, Bonneville will evaluate if any changes need to be made to this policy.

Bonneville seeks comment on its proposal to adopt the Interchange Rights Holder Methodology.

3. System Operations Tools

Proposal: Bonneville proposes to maintain its current suite of operational tools used to manage the federal power and transmission systems if it becomes an EIM Entity.

Background

This section focuses on the operational tools currently used by Bonneville to meet its reliability and environmental responsibilities, and whether Bonneville can continue to use these tools if it joins the EIM. In short, Bonneville believes that it can continue using these tools if it joins the EIM.

Before addressing specific tools below, it is important to note two general principles. First, in regard to applicable NERC reliability standards, Bonneville will continue to be solely responsible for complying with those standards in its balancing authority area and for the transmission system it owns or operates even if it joins the EIM. The CAISO assumes no responsibility regarding reliability standards applicable to EIM Entities.

Second, Bonneville will also remain responsible for meeting its environmental responsibilities if it joins the EIM. While the CAISO, as the EIM market operator, will respect Bonneville's environmental responsibilities, the CAISO will not be responsible for complying with those obligations.

Finally, it is worth noting that Bonneville employs many operational systems, tools, and processes to reliably operate the federal power and transmission systems in order to meet its Tariff, compliance, and environmental requirements. Bonneville believes these

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[142] *See, e.g., PacifiCorp*, 147 FERC ¶ 61,227, at P 113 (2014); *PacifiCorp*, 149 FERC ¶ 61,057, at P 32 (2014); *Puget Sound Energy*, 155 FERC ¶ 61,111, at PP 11, 73, 76 (2016).
[143] *Id.*

BPA-2020-00784-F 0015

operational systems, tools, and processes are compatible with the EIM and will continue their use if it joins the EIM.

Bonneville has received specific inquiries about two of its operational tools—Operational Controls for Balancing Reserves (OCBR) and Oversupply Management Protocol (OMP)—regarding how they would be impacted if Bonneville were to become an EIM Entity. The following two subsections specifically address those tools. Based on Bonneville's analysis and discussions with the CAISO to date, Bonneville can become an EIM Entity and maintain both of these tools.

Operational Controls for Balancing Reserves (OCBR)

OCBR is a system reliability tool that Bonneville uses to balance load and generation in its balancing authority area.[144] Generally, actual generation and load should match scheduled generation and load for the hour. Bonneville uses OCBR when within-hour variability of generation and load consumes balancing reserve capacity to a certain level. Under OCBR, Bonneville will take steps to reduce variability, such as curtailing generation schedules to actual generation levels or limiting generation to schedule, in order to maintain Bonneville's system reliability.

While the EIM will optimally dispatch imbalance energy every 5 minutes to Bonneville's balancing authority area, Bonneville believes that it is important to maintain OCBR. Bonneville is still required to hold and deploy regulation to balance generation and loads in its balancing authority area within the CAISO's 5-minute EIM dispatches, for which OCBR will be necessary to manage regulation over-deployment. OCBR is also necessary to maintain in case Bonneville is unable to participate in the market (*e.g.*, withdraws or fails resource sufficiency for a given interval).

Oversupply Management Protocol (OMP)

OMP is an operational tool used to address certain environmental conditions in the Columbia River Basin and maintain load-generation balance in Bonneville's balancing authority area during those conditions. During times of river flows, typically in the spring when loads in Bonneville's balancing authority area are low, water must be passed through the dams in one of two ways: spilled over the dams, or run through the turbines to generate electricity. When water is spilled over the dams, it creates bubbles of air in the water that,

[144] Bonneville uses certain hydro projects in the FCRPS to respond to within-hour deviations in generation and load by constantly increasing and decreasing generation output. This balancing is necessary to keep the electric system stable.

BPA-2020-00784-F 0015

at certain levels, can be harmful to salmon and other aquatic species. This is referred to as total dissolved gas (TDG) and is regulated by the states of Oregon and Washington under the Clean Water Act.

When the Columbia River reaches TDG limits, Bonneville must limit spill by passing water through the generating turbines, thus creating electricity. Bonneville offers this electricity as low as zero cost; however, in the spring, there are occasions when there is not sufficient load to use the electricity, even at zero cost. As a result, Bonneville adopted Attachment P to its Transmission Tariff, creating a least-cost cost curve for displacing generation in the balancing authority area and reimbursing displaced generators for certain costs related to the displacement, so that Bonneville can pass water through its generating turbines and maintain generation-load balance. Attachment P has been approved by FERC under section 211A of the Federal Power Act.[145]

At this time, Bonneville is proposing to maintain OMP as it is currently set forth in Attachment P. If Bonneville joins the EIM, it still needs a mechanism to reduce generation located in its balancing authority area to minimum generation levels in order to comply with its environmental responsibilities. Bonneville does not believe that the EIM provides a market solution that achieves that objective as effectively as OMP today. That said, Bonneville will consider other methods of managing over-generation in its balancing authority area if more effective ways of achieving the goals of OMP are discovered. OMP is also necessary to maintain in case Bonneville is unable to participate in the market (*e.g.*, withdraws or fails resource sufficiency for a given interval).

Conclusion

Joining the EIM does not change Bonneville's system reliability and environmental responsibilities that necessitate the system operations tools discussed above. As such, Bonneville proposes to maintain these tools to manage the federal power and transmission systems if it becomes an EIM Entity. Bonneville solicits comments from stakeholders on this proposal.

4. Carbon Obligations and Related Matters

Proposal: Bonneville's policy proposal on carbon in the EIM is to opt out of selling directly into California via the EIM unless Congress grants Bonneville authority to directly purchase

[145] *Iberdrola Renewables, Inc. v. Bonneville Power Admin.*, 149 FERC ¶ 61,044 (2014).

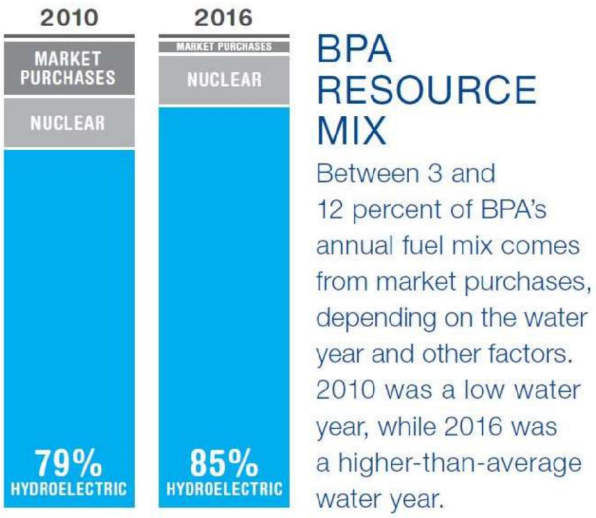
BPA-2020-00784-F 0015

allowances under California and other state carbon programs. Bonneville does not believe this issue precludes its participation in the EIM.

Background on Carbon in the EIM

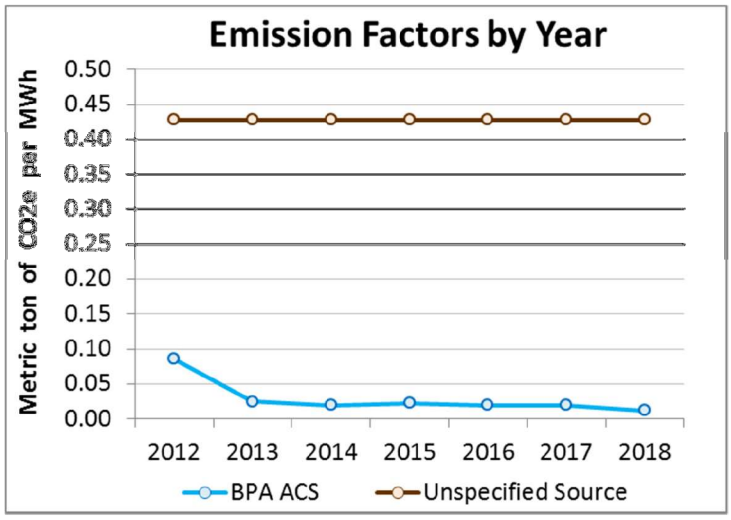
In accordance with California's cap-and-trade program administered by the California Air Resources Board (CARB), any entity that exports electricity into California (from another state) must purchase carbon allowances to cover carbon emissions associated with the electricity imported into California. If other states adopt cap-and-trade or other carbon pricing programs, electricity that is imported into those states could be similarly regulated.

While the hydro system and Columbia Generating Station produce carbon-free electricity, there is a small amount of carbon associated with the FCRPS. Bonneville uses federal power produced by FCRPS and other resources (non-federal) it acquires to meet its contractual supply obligations. In meeting those obligations Bonneville regularly acquires power from the market to balance its resources and loads. Market purchases typically account for between 3 to 12 percent of Bonneville's total annual power supply. States with greenhouse gas (GHG) reporting programs such as California typically attribute a default emissions factor to market purchases. Thus, because of the emissions attributed to the market purchases, the FCRPS as a whole has a small amount of carbon emissions associated with it.



Since the implementation of the California-cap-and-trade program in 2013, Bonneville has been recognized by the CARB as an Asset Controlling Supplier (ACS). An ACS is a specific type of electric power entity approved and registered by CARB. CARB assigns a system

emission factor for the wholesale electricity procured from the ACS's system and imported into California. Bonneville and two other entities (Tacoma Power and Powerex) have been approved by CARB as ACSs. Bonneville voluntarily reports its fuel mix data to CARB and, based on that reporting, CARB assigns Bonneville an ACS emissions factor. Bonneville's ACS emission factor has been very low over the last few years, averaging around 0.02 metric tons of CO_2 equivalent per MWh. This constitutes a need to purchase roughly one allowance for every 50 MWh sold into California, and the cost of compliance is roughly $0.30 per MWh at prevailing carbon allowance prices.



Units:	Metric ton CO2e per MWh	MWh	$ per metric ton CO2e	$ per MWh
Source	**Emission Factor**	**Imported Power**	**GHG Allowance Price**	**GHG Cost**
Unspecified Source	0.43	1	$16	$6.8
BPA ACS	0.02	1	$16	$0.3
Difference	0.41			$6.5

This low ACS emission factor adds value to FCRPS sales into the California market. However, the federal government has determined that California carbon allowances constitute a state tax. Under the U.S. Constitution a state cannot tax the federal

government, in particular a federal agency like Bonneville, unless Congress specifically authorizes the agency to pay the tax. As a consequence, Bonneville currently cannot purchase these allowances. In order to sell into California without purchasing carbon allowances, Bonneville has entered into third-party arrangements to sell to entities that, in turn, take Bonneville's power into the California market and incur the resulting carbon compliance obligation. These third-party arrangements are inefficient and have an incremental cost. In the near future, Bonneville's inability to purchase carbon allowances could impact Bonneville's marketing in other western states if other states adopt cap-and-trade programs similar to California's.

As it pertains specifically to the EIM, CARB considers the Participating Resource Scheduling Coordinator to be the entity with the compliance obligation under the cap-and-trade program, meaning the Participating Resource Scheduling Coordinator is responsible for acquiring the allowances to cover any carbon associated with the EIM import. Entities participating in the EIM must indicate a GHG adder cost in their bid that reflects the cost of purchasing any allowances associated with the import. However, there is an option that Participating Resource Scheduling Coordinator can choose to avoid deliveries to California and thus avoid the GHG adder cost.

Bonneville is proposing to use three aggregations of the big-10[146] hydro projects for bidding resources into the EIM, but the ACS emissions factor would still be attributed to Bonneville's bids. This is because of the system sales concept, discussed in section III.b.3, and because Bonneville can only bid from these aggregated projects if it operates its entire system in a way that "sets up" those big-10 resources to be able to bid. That is, with a run of river system water must be moved and stored in a coordinated fashion in order for the aggregated resources to be available.

Intended Resolution

Bonneville would need statutory expenditure authorization in order to directly purchase allowances under California's, and potentially other states', cap-and-trade programs. This authorization is important to Bonneville in order to be able to sell into evolving markets such as the EIM. The authorization would provide cost savings because Bonneville would not have to go through third-parties (and pay them) to access the California wholesale market. Additionally, the authorization is important because there is no guarantee that third parties will always be willing to provide this service to Bonneville. Finally, other

[146] *See* section III.e.1.

BPA-2020-00784-F 0015

states may also enact carbon pricing programs that place a compliance obligation on electricity, similar to California's program.

As indicated above, EIM participants can elect to not sell into California. In the event Congress does not authorize Bonneville to purchase allowances in time for participation in the EIM, Bonneville intends to opt out of selling directly into California via the EIM. In that case, no power would be deemed sold into California and Bonneville would not incur any compliance obligations under the California cap-and-trade program because Bonneville would not be importing into California through the EIM. Bonneville recognizes that this could impact the value of participating in the EIM; however, the expectation is that this impact would be small.[147] If Congress authorizes Bonneville to purchase allowances at a later date, Bonneville can change its election and begin selling into California via the EIM at that time.[148]

Bonneville also identified another potential option for participation in the EIM, using a third party as the Participating Resource Scheduling Coordinator. Since CARB identifies the Participating Resource Scheduling Coordinator as the entity with the compliance obligation under the cap-and-trade program, if Bonneville utilized a third party, that party would take on the compliance obligation. In CARB's interpretation, the Scheduling Coordinator would be the "electricity importer" into California, thus they would be required to obtain carbon allowances and surrender them to CARB. This third party would theoretically be performing various tasks for Bonneville, which is important in ensuring Bonneville is getting additional value from the third party and this is not simply a direct pass-through to cover the costs of the carbon allowances. However, other than identifying this as a potential option, Bonneville has not explored whether it is feasible to use a third party as the Participating Resource Scheduling Coordinator, and what business value the third party might provide aside from eliminating Bonneville's CARB compliance obligation.

Conclusion

Bonneville's policy proposal on carbon in the EIM is to opt out of selling directly into California via the EIM unless Congress provides authorization for Bonneville to directly purchase allowances under California and other state carbon programs. Bonneville does not believe this issue precludes its participation in the EIM.

Bonneville welcomes comments on this policy proposal.

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[147] *See* section III.d.2.ii.

[148] The fiscal year 2020 House Energy and Water Development Appropriations bill, which passed out of the full House Appropriations Committee on May 21, 2019, includes statutory language which would give Bonneville expenditure authorization to purchase these carbon allowances if enacted.

BPA-2020-00784-F 0015

5. Market Power (LMPM and DEB)

Proposal: Bonneville proposes that the enhancements to the CAISO's Local Market Power Mitigation procedures to be filed this summer with FERC for approval are sufficient to address Bonneville's concerns regarding the current procedures. Bonneville will continue to monitor the progress of the enhancements through FERC's approval process and, if approved, the CAISO's implementation process. If the proposed enhancements are not approved or are substantially revised by FERC such that Bonneville's concerns are no longer addressed, Bonneville will reconsider whether (or how) it will join the EIM.

Background

One of the primary objectives of electricity market design is efficient load service; that is, the deployment of lowest cost generation resources to serve loads recognizing transmission constraints. Achieving this efficiency requires a market design that prevents participants from exercising market power by raising market prices above otherwise competitive market outcomes.

The CAISO administers the Local Market Power Mitigation (LMPM) procedures set forth in the CAISO's Tariff to determine when and how to mitigate the impacts of a participant potentially exercising market power. The CAISO applies the LMPM procedures to the entire EIM footprint. Thus, if Bonneville joins the EIM, the CAISO's LMPM procedures will apply to EIM dispatches into and out of Bonneville's balancing authority area. As discussed further below, Bonneville has serious concerns with the CAISO's current LMPM procedures and their impact on Bonneville's potential EIM participation with its hydro resources.

Today, if an EIM participant is determined to have market power, the CAISO may mitigate the participant's bid(s) to a Default Energy Bid (DEB), which is used in the CAISO's optimization (or market run). Presently, market participants may choose from three options in determining their DEB:

1. *Variable Cost Option*:[149] Based on heat rate, fuel price, GHG costs, etc.;
2. *Locational Marginal Price (LMP) Option*:[150] Based on lowest 25th percentile of LMPs at which a Participating Resource was dispatched in the last 90 days; or
3. *Negotiated Rate Option*:[151] Based on a formula bilaterally negotiated between a Participating Resource Scheduling Coordinator and the CAISO/DMM.

[149] CAISO Tariff § 39.7.1.1.
[150] *Id.* at § 39.7.1.2.
[151] *Id.* at § 39.7.1.3.

BPA-2020-00784-F 0015

Bonneville's Concerns Regarding the CAISO's Current LMPM Procedures

Bonneville has several concerns regarding the CAISO's current LMPM procedures. First, the procedures do not adequately address energy limited hydro systems, such as the FCRPS.[152] While existing options may be sufficient to approximate the marginal cost of supply for most thermal-based resources in the EIM footprint, the existing options do not capture the forward-looking nature of the opportunity cost of hydro generation.[153]

Bonneville also believes that the duration of a DEB under the current procedures is unnecessary. Currently, if a participant is determined to have market power, it would be mitigated throughout the remainder of the operating hour, instead of the just the specific 15-minute interval(s) in which the participant is determined to have market power.

Finally, Bonneville is concerned that the application of existing DEBs has been known to induce unintended flows between EIM Entity balancing authority areas or result in incremental transfers beyond the transfers modeled in unmitigated market runs. This has the potential to discourage additional EIM participation.

The CAISO's Proposed Modifications to its LMPM Procedures

The CAISO initiated an LMPM stakeholder initiative in September 2018 addressing the issues discussed above.[154] Bonneville and other Pacific Northwest parties with hydro resources actively participated in that initiative to persuade the CAISO to develop a default energy bid formulation for hydro resources with storage capability and to enhance other components of the LMPM procedures.

Bonneville views the outcome of the LMPM stakeholder initiative as favorable to Bonneville and other Pacific Northwest hydro generation parties. Enhancements to the LMPM procedures included:

[152] An "energy limited hydro system" is one in which the binding constraint is fuel (water) rather than a limit derived by machine-rated (nameplate) capacity.
[153] Opportunity costs for hydro resources should include the costs of forgone future generation when prices are higher due to market dispatches in the present or near-term.
[154] For more information regarding the CAISO's 2018 LMPM Enhancements stakeholder initiative, see http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalMarketPowerMitigationEnhancements2018.aspx.

BPA-2020-00784-F 0015

1. A fourth DEB option that more accurately reflects the opportunity costs of hydro resources. The fourth DEB option includes:
    a. A formula that incorporates the forward storage horizon of a Participating Resource;
    b. A multiplier that recognizes the inherent variation of prices and a Participating Resources' ability to target or shape its output to the highest value periods;
    c. Inclusion of a price floor based on a gas turbine heat rate meant to proxy a replacement power purchase;
    d. Recognition of the combined value of energy and firm transmission rights when coupled together for delivery; and
    e. The ability to update parameters of the DEB, such as multiplier levels, upon request.
2. Market power mitigation will occur for only the 15-minute interval(s) when market power is determined to exist instead of the entire operating hour.
3. Market rules will limit transfers between two EIM balancing authority areas to a specified amount so that unintended market flows due to mitigation are minimized.

This summer the CAISO plans to file the proposed Tariff language reflecting these enhancements with FERC for approval. Bonneville will intervene in and closely follow that proceeding.

Conclusion

Bonneville is satisfied with the outcome of the CAISO's LMPM stakeholder initiative and the substance of the LMPM enhancements to the CAISO's Tariff to be filed with FERC this summer. The issues raised by Bonneville and other Pacific Northwest parties with hydro resources were largely addressed in a satisfactory manner during the CAISO's stakeholder initiative process. That said, Bonneville will closely monitor the CAISO's Tariff filing proceeding before FERC. Assuming FERC approves the current draft language, Bonneville will consider the proposed enhancements sufficient to address its current concerns with the CAISO's current LMPM procedures. If FERC does not approve the CAISO's proposed Tariff language or significantly modifies it, Bonneville will revisit the LMPM issue and determine whether it will pursue joining the EIM using the negotiated DEB option. Please provide comments on Bonneville's proposed approach to the LMPM issue.

BPA-2020-00784-F 0015

6. Load Aggregation

Proposal: Bonneville proposes to initially have one load aggregation point (LAP) if it becomes an EIM Entity.

A load aggregation point (LAP) is a weighted average of multiple locational marginal price nodes used for the settlement of non-participating load imbalance[155] in an EIM Entity's balancing authority area.

Bonneville staff has discussed load modeling with the CAISO and has benchmarked other EIM Entities regarding how they model their loads. To date, every EIM Entity has chosen to use a single LAP for their respective balancing authority areas.[156] The consensus is that having a single LAP reduces workload, costs, and complexity because having multiple LAPs requires different load forecasts, prices, meters, and uninstructed imbalance energy settlements[157] for each LAP. The reason to have multiple LAPs would be if there is significant weather variation across a balancing authority area resulting in dramatically different demand forecast patterns, or significant and persistent congestion across subsystem boundaries resulting in significantly different prices for multiple LAPs. Such conditions do not exist in Bonneville's balancing authority area, so Bonneville does not see a reason to use more than one LAP.

A single LAP for Bonneville's entire balancing authority area would be easier to manage from both an operational and settlements perspective and have less initial startup costs than designing systems to accommodate multiple LAPs. This, however, does not preclude Bonneville from deciding later to pursue a multiple LAP model as it gains more experience in the EIM.

Conclusion

At this time, Bonneville has not identified a compelling operational or business reason to use more than one LAP. If Bonneville decides at a later date to pursue additional LAPs, it will do so. Bonneville solicits stakeholder input and comment on this proposal.

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[155] Non-participating load is load that does not have an economic bid in the EIM.
[156] PacifiCorp has separate LAPs for its PAC-East and PAC-West balancing authority areas.
[157] Uninstructed energy imbalance is comparable in principle to Bonneville's Energy Imbalance service today.

BPA-2020-00784-F 0015

7. Resource Sufficiency – Balancing Authority Area Level

Proposal: Bonneville proposes that the CAISO's resource sufficiency requirements are not an impediment to Bonneville participating in the EIM.

Background

The CAISO uses a resource sufficiency (RS) evaluation to determine whether each EIM Entity has procured, prior to each operating hour, sufficient energy, capacity, flexibility, and transmission to serve imbalance in its own balancing authority area.[158] The objective of the RS evaluation is to ensure that an EIM Entity does not lean on other EIM Entities in real-time to serve imbalance in its balancing authority area.

The CAISO's real-time RS evaluation for the EIM is not a longer-term resource adequacy program as applied to the CAISO's other markets. The CAISO does not enforce any resource adequacy requirements as part of its RS evaluation, and there are no resource adequacy standards applicable to the EIM. There are no capacity payments or must-offer obligations associated with RS. Moreover, outcomes of the RS tests are not determinative as to whether an EIM Entity is meeting applicable NERC reliability standards. An EIM Entity could fail RS and still meet applicable NERC reliability standards.

As shown in the table below, the CAISO evaluates each EIM Entity for RS every hour in real-time using four tests, which are performed sequentially. The RS evaluation determines if an EIM Entity is allowed to participate in the EIM to optimally serve its imbalance needs. If an EIM Entity fails RS, it must rely on its own resources, including any bilateral arrangements with external resources and limited interaction with the EIM to meet its imbalance. Capacity held for balancing authority operational requirements is not considered as part of the capacity needed to meet RS requirements.

[158] For a more in-depth discussion of the CAISO's RS evaluation and process, see Bonneville's stakeholder materials dated January 16, 2019, which can be viewed at https://www.bpa.gov/Projects/Initiatives/EIM/Doc/20190119-EIM%20Stakeholder%20Mtg.pdf.

RS TEST	DESCRIPTION	CONSEQUENCES OF FAILURE
Transmission Feasibility Test	Identifies if an EIM Entity's base schedules are limited by congestion	None— advisory only.
Balancing Test	Ensures that an EIM Entity's load/ resources are balanced going into the hour	Failure does not result in limitations on EIM transfers but will be used to determine if an EIM Entity is evaluated for over/under scheduling penalties.
Bid Range Capacity Test	Ensures that the EIM Entity has bid range to cover expected imbalance	An EIM Entity can fail in one or both directions (import and export) for a 15-minute market interval. Failure of capacity test in a given direction results in failure of the Flexible Ramp Sufficiency test in the same direction.
Flexible Ramp Sufficiency Test	Ensures the EIM Entity has ramping capability to meet expected load ramp and uncertainty	An EIM Entity can fail in one or both directions (import and export) for a 15-minute market interval. Failure results in EIM transfers being limited in the failed direction for that interval.

Impacts of the CAISO's RS Evaluation on Bonneville

While Bonneville has not determined how it will bid flexibility in an EIM, Bonneville's preliminary analysis indicates that it would pass the RS evaluation a significant amount of the time using historical spinning availability. This provides Bonneville with a high level of confidence that it can achieve the benefits described in the business case. The likelihood of passing the RS evaluation would increase if any additional bid flexibility is made available, whether from federal or non-federal Participating Resources.

Conclusion

The CAISO's resource sufficiency standards are not an impediment to Bonneville participating in the EIM. Bonneville seeks comments on this proposal.

BPA-2020-00784-F 0015

IV. EIM Implementation Agreement

Proposal: Bonneville proposes to execute the EIM Implementation Agreement included as Attachment C. Bonneville's Implementation Agreement includes a high-level project schedule and funding commitment by Bonneville of $1.87 million to pay the CAISO for funding the costs associated with joining the EIM.

a. Background

An EIM Implementation Agreement is the first in a series of agreements necessary for a balancing authority to become an EIM Entity.[159] In general terms, an Implementation Agreement establishes a high-level project plan and schedule that sets forth the steps that a balancing authority and the CAISO must take in order for a balancing authority to join the EIM. However, the Implementation Agreement does not obligate a balancing authority to join the EIM.

The Implementation Agreement also requires a prospective EIM Entity to fund a portion of the CAISO's already incurred EIM-related startup costs. To ensure the fair and equitable allocation of such costs, the funding amount set forth in each Implementation Agreement is based on a formula that considers the percentage of a prospective EIM Entity's total balancing authority net energy for load (NEL)[160] as part of the total NEL in the entire WECC footprint. The CAISO then uses this percentage to allocate its total estimated start-up costs for the EIM to each prospective EIM Entity in the Implementation Agreement.[161] The CAISO's total estimated startup costs for the EIM include:

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[159] Following an EIM Implementation Agreement, the CAISO and prospective EIM Entity must execute an EIM Entity Agreement, EIM Scheduling Coordinator Agreement (if the Entity is serving as its own Scheduling Coordinator), meter agreement, and other potential agreements as necessary. For more information regarding the agreements that are necessary in the EIM, please see https://www.westerneim.com/Documents/EIMTrack2Overview-Agreements.pdf.

[160] NERC defines NEL as "net generation of an electric system plus energy received from others less energy delivered to others through interchange. It includes system losses but excludes energy required for the storage of energy at energy storage facilities." NERC Rules of Procedure, Definitions, Appendix 2, *available at* https://www.nerc.com/FilingsOrders/us/RuleOfProcedureDL/NERC_ROP_Effective_20180719.pdf.

[161] The CAISO files each executed Implementation Agreement with the Federal Energy Regulatory Commission (Commission) for approval. The filing of the Implementation Agreement includes a declaration from a CAISO representative that outlines the basis for and allocation of the CAISO's estimated EIM startup costs to EIM Entities in the agreement. The Commission has found the CAISO's cost-allocation mechanism to be just and reasonable and approved it accordingly. *See, e.g., Cal. Indep. Sys. Operator*, 143 FERC ¶ 61,298, at PP 4-5 (2013) (the Commission's acceptance of the CAISO's cost allocation of EIM startup costs in PacifiCorp's Implementation Agreement).

BPA-2020-00784-F 0015

CAISO Estimated EIM Start-Up Costs (in thousands of dollars)	
Licenses	12,150
EMS system improvements	1,000
Data storage	2,000
Necessary hardware upgrades	500
Production software modifications	1,000
Network configuration and mapping	500
Integration	500
Testing	1,500
System performance tuning	250
Training and operations readiness	150
Project management	150
Total	**19,650**

The Implementation Agreement terminates on its own terms when an EIM Entity "goes live" in the EIM, meaning when market transactions become financially binding. Subsequent agreements such as the EIM Entity Agreement and EIM Entity Scheduling Coordinator Agreement, which are signed before an EIM Entity's go live date, continue in effect so long as a balancing authority is participating in the EIM. A prospective EIM Entity can terminate the EIM Implementation Agreement on 30 days' written notice and is only responsible for paying the costs associated with milestones accomplished at the time written notice is provided. In addition, the CAISO will work with a prospective EIM Entity to extend the Agreement if additional time is necessary for implementation.

b. Bonneville's Implementation Agreement with the CAISO

Bonneville's proposed Implementation Agreement is included in Exhibit C. It is generally similar in substance and form to all other Implementation Agreements that have been negotiated and executed by the CAISO and other existing or prospective EIM Entities. That said, Bonneville's Implementation Agreement does have some unique provisions, which are addressed in more detail below.

Bonneville's funding requirement set forth in the Implementation Agreement is $1.87 million. As discussed in the preceding section, this represents Bonneville's proportional share of the CAISO's total estimated start-up costs for the EIM based on

BPA-2020-00784-F 0015

Bonneville's NEL within the WECC footprint.[162] As set forth in section 4(c) and Exhibit A of the Implementation Agreement, Bonneville will make six equal payments to the CAISO tied to particular project milestones.

Bonneville's Implementation Agreement also includes language regarding FERC's lack of jurisdiction over Bonneville in section 1(e) that is comparable to the language used by other non-jurisdictional entities in their Implementation Agreements.

c. Bonneville-Specific Language in the Implementation Agreement

Section 14 of Bonneville's Implementation Agreement contains several provisions specific to Bonneville's implementation efforts and its potential participation in the EIM. The provisions described below that are applicable to Bonneville's potential participation in the EIM will be memorialized in subsequent participation agreements, such as the EIM Entity Agreement.

1. *Statutory, Regulatory, and Contractual Requirements*. This provision provides that Bonneville's EIM implementation and participation will be consistent with its statutory, regulatory, and contractual requirements. For more information regarding these requirements, please see section III.b.

2. *Voluntary Market Participation*. This provision provides that Bonneville's EIM participation will be predicated on rules voluntarily allowing market entry and exit, voluntarily submitting bid and offer volumes and pricing, voluntarily donating transmission for EIM Transfers, and voluntarily foregoing EIM Transfers in one or more specified operating intervals consistent with the CAISO and Bonneville Tariffs. As described in several other sections of this Proposal, the voluntary nature of EIM participation will be a key consideration of Bonneville's ultimate decision regarding whether to join the EIM.

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[162] Bonneville's $1.87 million payment was calculated as follows:
1. To determine a per MWh charge for creating and implementing the EIM outside of the CAISO's balancing authority area assessed to all prospective EIM Entities, the CAISO's estimated EIM startup cost of $19,650,000 million was divided by the total WECC-wide NEL, excluding the CAISO's NEL, of 636,200,000 MWh which equals $.031 per MWh. The CAISO's EIM startup costs are set forth above.
2. To determine Bonneville's share of the CAISO's startup costs, Bonneville's NEL of 60,000,069 MWh was then multiplied by the .031 MWh, which equals $1,869,302 (or rounded to $1.87 million).

The NERC data used for these calculations can be accessed at: https://www.nerc.com/gov/bot/FINANCE/2018%20NERC%20Business%20Plan%20and%20Budget%20%20Final/2018%20Assessments_2016%20NEL_FINAL_8.18.17.pdf.

BPA-2020-00784-F 0015

3. *Reliability and Operation of the Federal Power and Transmission Systems*. This provision provides that Bonneville retains authority over matters relating to reliability and operation of the FCRPS and FCRTS. As described in section III.e.3, Bonneville will retain its existing reliability tools.

4. *Federal Generation Participation*. This provision allows Bonneville to utilize the CAISO's resource aggregation models for EIM participation. As discussed in section III.e.1, Bonneville is proposing to join the EIM using three aggregated Participating Resources.

5. *Automation Support*. This provision states that the CAISO will provide technical support as Bonneville works to automate many of the interactions with existing EIM interfaces during the implementation phase. Bonneville has identified the following interactions for potential automation: declaring contingency events, manual dispatches, load biasing, and setting EIM transmission interface operating limits. Bonneville continues to scope what interactions it will seek to automate.

6. *Greenhouse Gas Attributes.* This provision provides that if Bonneville allows FCRPS energy to be delivered directly to California in the EIM, those deliveries will be consistent with California's Cap and Trade program and may include Bonneville's status as an Asset Controlling Supplier. For more information regarding Bonneville and California's carbon policy, see section III.e.4.

7. *Base Schedule Submission Timeframes*. This section provides that the CAISO will pursue changing the market closing timeline for financially binding hourly resource plans from T-40 to T-30. Bonneville believes this change will provide benefits to its stakeholders, particularly customers holding Slice power sales contracts.

8. *Consideration of Other EIM Enhancements*. This section includes four potential enhancements that Bonneville will propose in the CAISO policy-making process. While Bonneville's participation is not expressly contingent upon these enhancements, Bonneville believes these are important enhancements to the EIM that should be considered by the CAISO. The CAISO will explore these enhancements with Bonneville and other interested stakeholders. These enhancements include:

BPA-2020-00784-F 0015

a. *Improving the accuracy of hourly resource plans.* This proposal will focus on certain market design enhancements that would improve the accuracy of hourly resource plans and, in turn, help EIM Entities meet their respective resource sufficiency obligations.

b. *Permit resource sufficiency obligation transfers, e.g., bid range transfers.* This proposal will allow an EIM Entity to bilaterally negotiate a transfer of capacity to another EIM Entity to help the latter Entity meet its resource sufficiency obligations.

c. *Improve the flexible ramping sufficiency test.* This proposal will focus on enhancements improving the flexible ramping sufficiency test, such as the incorporation of VER forecasts into the flexible ramping requirement computation.

d. Increase transparency of data required for validation of EIM settlement statements. This proposal will explore appropriate methods for the CAISO to share additional market data with EIM Entities to allow them to fully validate the EIM settlement statements they receive from the CAISO.

Bonneville requests stakeholder comments and feedback on the Implementation Agreement included as Attachment C.

V. Remaining Policy Decisions Planned for Phase III

As explained in section II, Bonneville will hold stakeholder meetings, as well as pre-rate and pre-Tariff proceeding workshops on the remaining important policy issues that are not being covered in this Proposal and the ROD. These issues include:

a. Transmission Usage – Network
b. Allocation of EIM Charge Codes
c. Resource Sufficiency – Sub-Balancing Authority Area Level
d. Transmission Losses
e. Non-federal Resource Participation Requirements
f. Settlements/Billing (Mechanics)
g. Data Submission Requirements
h. Metering Requirements

This section briefly describes the policy issues that Bonneville plans to address during Phase III.

BPA-2020-00784-F 0015

a. Transmission Usage Network

As discussed in section III.e.2, Bonneville is proposing to utilize the Interchange Rights Holder methodology to make transmission available for EIM Transfers—transfers between EIM balancing authority areas. That decision does not address what, if any, provisions are necessary regarding transmission internal to Bonneville's own EIM balancing authority area.

Bonneville plans to address the subject of transmission within the EIM balancing authority area during Phase III. That process may include provisions for Participating Resources and for loads. Bonneville will likely have a similar high-level rubric for this subject as it did for EIM Transfers—striking a balance between the efficient operation of the market with ensuring cost recovery. Bonneville will also discuss with stakeholders the mechanics of managing internal transmission consistent with EIM operations.

b. Allocation of EIM Charge Codes

If Bonneville joins the EIM as an EIM Entity, Bonneville will be responsible for receiving, verifying, and paying bills, comprised of multiple charge codes, generated by the CAISO settlement system. A charge code refers to a specific settlement calculation identified in the CAISO's Business Practice Manual.[163] There are around 44 active charge codes that the CAISO could settle with Bonneville in the EIM.[164]

CAISO settlement invoices are aggregated at the balancing authority area level, and not broken down by individual Bonneville customer. Nonetheless, Bonneville must pay the CAISO, and then use its own rates to recover these costs from its Tariff customers. As such, Bonneville will need to decide whether and how it will allocate the CAISO's settlement charge codes to its transmission customers. Note that Participating Resources are billed by and settle charges directly with the CAISO.

The Phase III process is expected to result in a cost allocation design which will be included in the BP-22 and TC-22 proceedings, as appropriate.

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[163] *See* CAISO Tariff, Appendix A, *available at* http://www.caiso.com/Documents/AppendixA-MasterDefinitionSupplement-asof-Apr1-2019.pdf.
[164] *See* ISO Market Charge Code Matrix, *available at* http://www.caiso.com/market/Pages/Settlements/Default.aspx.

BPA-2020-00784-F 0015

c. Resource Sufficiency – Sub Balancing Authority Area level

As discussed above,[165] Bonneville's balancing authority area will be evaluated as a whole for Resource Sufficiency on an hourly basis, with the results impacting its market participation. Though the balancing authority area will be evaluated in aggregate, there are multiple resources and Load Serving Entities (LSE) that can influence the outcome of those evaluations. Bonneville will consider developing policies to ensure it passes Resource Sufficiency evaluations as often as feasible.

These requirements may influence and/or be memorialized in the BP-22 and TC-22 cases.

d. Transmission Losses

As energy is physically delivered across a transmission system there is a natural degradation, or "loss," that occurs due to physical factors such as distance and the overall loading of transmission facilities. Transmission losses represent additional physical generation that is necessary to make up the difference between a scheduled amount of energy and what is "lost." Bonneville currently requires transmission customers to either designate to return transmission losses in kind (*e.g.*, with a physical delivery of energy) 168 hours (one week) later or settle them financially.

The EIM automatically dispatches incremental losses (above base schedules, which include losses) as part of its optimized dispatch. The EIM also creates a real-time marginal price for those losses at the time of their delivery. Bonneville will discuss with stakeholders the extent to which the EIM's handling of losses should lead to changes in Bonneville's current practices regarding transmission losses, or what new opportunities are available for a more efficient repayment of losses. This may include the potential for moving to a practice in which losses are only settled financially instead of a physical repayment. Decisions in this process will likely influence and/or be memorialized in the BP-22 and TC-22 cases.

e. Non-federal Resource Participation Requirements

As discussed above, Bonneville plans to utilize the "Big-10" FCRPS projects—aggregated into three separate resources—as its own Participating Resources. Bonneville will also need to develop requirements to provide the owners/operators of non-federal resources within the Bonneville balancing authority area the opportunity to act as Participating Resources.

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[165] *See* section III.e.7.

BPA-2020-00784-F 0015

These requirements may cover topics such as technical requirements, timing, and impacts on RS evaluations. Decisions in this process will likely influence and/or be memorialized in the BP-22 and TC-22 cases.

f. Settlements/Billing (Mechanics)

As discussed above in issue V.b, if Bonneville joins the EIM as an EIM Entity, Bonneville will need to decide whether and how to allocate the CAISO's charges and credits to Bonneville's transmission customers. If Bonneville decides to allocate some or all of the EIM charges and credits to its customers, Bonneville will need to decide how to bill its customers.

The CAISO's billing process is very different from Bonneville's current billing processes. Bonneville bills its customers monthly; the CAISO bills its customers weekly. The timeline for disputes under Bonneville's agreements is relatively flexible. Disputes of a CAISO bill must be received within 22 business days after receiving a settlement recalculation statement or the disputes is deemed waived. Bonneville does not routinely revise a final monthly bill and, if it occurs, does so for a particular situation; the CAISO performs multiple recalculations of an invoice before finally closing out the settlement statement 36 months after the fact.

The billing and settlement mechanics policy process in Phase III will be closely linked with the policy process on allocation of EIM charge codes.

g. Data Submission Requirements

Efficient functioning of the EIM is dependent on it having timely and accurate information. As such, Bonneville will need to provide a significant quantity of data regarding its EIM balancing authority area, including load and generation information from Bonneville's customers. Much of this data exists in various formats today, but Bonneville must ensure it has reliable and timely access for the EIM to function properly.

Bonneville's process will include discussions with its customers regarding the content, delivery, and timing of data needed for Bonneville to operate an EIM balancing authority area. This data, along with its timing and delivery, will include the submission of base schedules, outages, and meter data.

h. Metering Requirements

Physical meter data for generators and interchange is critical for accurate EIM settlements. The CAISO provides guidance and minimum standards for the submission of meter data for the EIM Entity and Participating Resource Scheduling Coordinator but Bonneville must develop metering requirements for the balancing authority area and submit them in a

BPA-2020-00784-F 0015

settlement quality meter data plan. This plan will be applicable to all parties in the balancing authority area, not just Bonneville. Discussions on this issue will include the quality and granularity of data as well as the submission of the data.

VI. Conclusion

Bonneville seeks comment on the proposed decisions described in this document. Please submit comments by July 22, 2019, online at www.bpa.gov/comments. Stakeholder comments will be addressed in the Record of Decision, in which Bonneville will make a decision on whether to sign the EIM Implementation Agreement and move forward toward joining the EIM, as described in section II.

Attachment B

Bonneville Power Administration
Energy Imbalance Market Benefits Study

Final Report

Attachment B

Bonneville Power Administration Energy Imbalance Market Benefits Study

Final Report

June 18, 2019



Energy+Environmental Economics

Bonneville Power Administration Energy Imbalance Market Benefits Study

Final Report

June 18, 2019

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Table of Contents

1 Overview of Benefits Study 1

2 Gross Dispatch Benefits 3

2.1 Modeling Methodology 3

2.2 Northwest Price Scenarios 5

2.3 Sensitivities 7

3 Transmission Benefits 10

4 Appendix i

4.1 Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch ii

4.2 Big 10 Hydro Spinning Capability Available for EIM Participation iii

4.3 Northwest EIM Price Statistics for 2016-2018 Historical Period iv

4.4 Sensitivity Assumptions v

4.5 Monthly Revenues by Scenario vi

4.6 Average Simulated EIM Transfers by Scenario vii

1 Overview of Benefits Study

Bonneville Power Administration (BPA) retained Energy and Environmental Economics, Inc. (E3) to study the potential economic benefits of BPA's participation in the Western Energy Imbalance Market (EIM), drawing on E3's experience performing similar benefits studies for other BAAs across the West. The goal of the benefits study was to estimate the benefit of BPA's participation in EIM using an industry standard EIM benefits modeling approach, customized to reflect the specific constraints and capabilities of BPA's system. E3 worked closely with BPA staff to define these input data and assumptions for representing BPA's system to best characterize both (1) the potential dispatch benefits under different price scenarios and subject to sensitivities in price regimes, hydro flexibility and operations as well as (2) the potential transmission benefits that BPA could realize through EIM participation.

Across the scenarios evaluated, this study found average annual gross dispatch benefits to BPA are shown in Table 1. Additional sensitivities relative to the Northwest Midpoint/Base Scenario are also shown in Table 1. We discuss the potential benefits of EIM as a complementary transmission tool for (1) transmission schedule curtailments and (2) as a platform for economically enabling non-wires solutions to moderately sized transmission constraints.

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Table 1. Gross Dispatch Benefits for Scenarios and Sensitivities

	Average Revenue ($ million)	Annual Revenue ($ million)		
Scenarios & Sensitivities		**2016**	**2017**	**2018**
PSEI Price Scenario	**36.1**	43.6	33.0	31.6
PACW Price Scenario	**40.4**	54.7	39.9	26.7
BPAT Price Scenario (Initial Scenario)	**48.9**	48.0	49.9	48.9
NW Midpoint/Base Scenario (PGE Price)	**39.2**	**49.5**	**39.9**	**28.2**
Reduced Price Volatility Sensitivity	**35.3**	44.9	36.1	24.8
California GHG Compliance Sensitivity	**34.6**	45.6	34.5	23.8
FRST-Only Participation Sensitivity	**24.4**	32.3	25.4	15.6
Higher Success Rate Sensitivity	**47.1**	59.4	47.8	34.0

2 Gross Dispatch Benefits

2.1 Modeling Methodology

E3 developed scenarios for estimating the gross EIM dispatch benefits from BPA purchasing and selling energy as an EIM participant. E3 modeled these benefits using an industry-standard price-taker PLEXOS methodology employed in E3's previous EIM benefits studies, together with actual BPA data and CAISO-reported EIM prices for calendar years 2016-2018. In these scenarios, the following conservative modeling assumptions were used to isolate the benefits of BPA operations alone:

- Historical Big 10 projects spinning capability[1, 2]
  (Combination of Big 6 projects feasible min/max output and residual Big 10 INC/DEC spin capacity, as illustrated in **Section 4.1**)
- 24-hour energy neutrality (to avoid hydraulic management issues)
- All non-Big-10 generators in BPA's BAA treated as fixed subhourly
- 75% success rate applied to calculate EIM benefits to offset PLEXOS model's perfect foresight within each dispatch day

[1] Limiting participation to historical spinning capability also reduces the amount of additional wear-and-tear due to subhourly redispatch associated with the EIM benefits estimated in this study.
[2] Historical spinning capability resulted in BPA failing the flexible ramping sufficiency test (FRST) about 15% of intervals. In these intervals, no EIM benefits are assigned; in practice, should BPA choose to join, the Big 10 Hydro would be scheduled differently to ensure that the FRST was passed the vast majority of the time.

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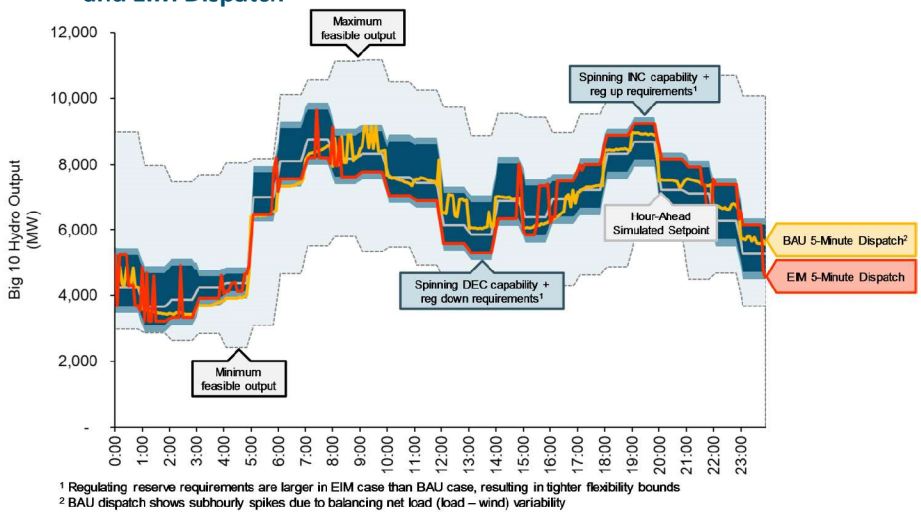
Figure 1 shows how these constraints combine to determine the flexibility available for subhourly dispatch in both the Business-As-Usual (BAU) and EIM cases. Under the BAU case, the subhourly flexibility is used to meet BPA's BAA net load variability and forecast error, while in the EIM case, the market is both a source and sink for economic flexibility. For example, when market prices are low, EIM purchases may be used instead of hydro dispatch to serve INC needs, while when prices are high hydro INC flexibility may be incremental sold into the EIM to increase revenues. Similar logic applies for DEC flexibility.

BPA-2020-00784-F 0015

Figure 1. Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch[3]



¹ Regulating reserve requirements are larger in EIM case than BAU case, resulting in tighter flexibility bounds
² BAU dispatch shows subhourly spikes due to balancing net load (load – wind) variability

2.2 Northwest Price Scenarios

We developed four Northwest Price Scenarios to illustrate the gross dispatch benefits of BPA's participation subject to exposure to various historical EIM prices in the region (see **Section 4.3** for summary statistics on Northwest prices). This gross dispatch benefit is calculated as the incremental net revenue (sales revenue – purchase cost) that BPA can achieve by transacting in the 15- and 5-minute EIM markets.

The Northwest Midpoint/Base Scenario used historical DGAP_PGE-APND prices from 2016 through 2018. We also assumed the same hydrological conditions, resource output, and loads within BPA's Balancing Authority Area footprint for

[3] See **Section 4.1** for enlarged version of this graphic.

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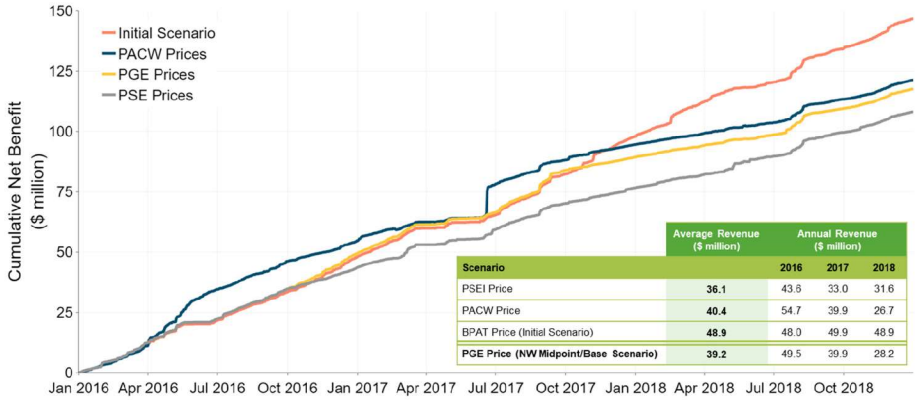
this period. This scenario showed gross dispatch benefits of **$39 million/year** on average over the 3 years due to BPA's participation in EIM during the historical years simulated. The effect of a broader range of Northwest EIM prices on gross dispatch benefits is shown below, which reflects the impact of different pricing conditions across the BAAs in the Northwest.

Figure 2. Cumulative Gross Dispatch Benefits for Northwest Price Scenarios[4]



Scenario	Average Revenue ($ million)	Annual Revenue ($ million)		
		2016	2017	2018
PSEI Price	36.1	43.6	33.0	31.6
PACW Price	40.4	54.7	39.9	26.7
BPAT Price (Initial Scenario)	48.9	48.0	49.9	48.9
PGE Price (NW Midpoint/Base Scenario)	39.2	49.5	39.9	28.2

Across these scenarios, we show that available hydro flexibility is a major factor in EIM value for BPA. In late spring/early summer months, where hydro flexibility is most constrained, the model shows that EIM benefits are lowest. See **Section 4.5** for monthly revenues for each scenario.

For the remainder of the study, the scenario using PGE prices (DGAP_PGE-APND) is considered as the **NW Midpoint/Base Scenario**.

[4] BPA's Northwest neighbors' price points span over times prior to these entities joining the EIM as well as after joining the EIM. PACW joined the EIM prior to the modeled historical period, PSE joined the EIM in the fall of 2016 while PGE joined the EIM in fall of 2017, which will have affected their prices and are reflected in these benefits.

BPA-2020-00784-F 0015

2.3 Sensitivities

In addition to the Northwest price scenarios, we analyzed four sensitivities based on the **NW Midpoint/Base Scenario** to independently illustrate the impact of different key assumptions. See **Section 4.3** for a qualitative discussion on these assumptions. The results of these sensitivities are shown in **Figure 1**. The sensitivities we considered were as follows:

- **Reduced Intra-Hour Price Volatility**
  In this sensitivity, we reduce intra-hour 15- and 5-minute EIM price volatility by 50% such that modeled EIM prices are 50% closer to their hourly average than observed by CAISO in the historical record for the DGAP_PGE-APND pricing node. This is meant to estimate the economic impact of a situation where subhourly volatility decreases relative to historical observations and/or the market is relatively "shallow" at extreme prices. However, this sensitivity preserves the diurnal pattern of prices. This sensitivity tends to reduce prices and the benefits.
- **California GHG Fee Compliance**
  In this sensitivity, we attempt to model the impact of BPA's inability to pay for GHG allowances associated with unspecified imports into California. To model this, we penalize the model for selling in intervals where historical EIM prices showed a nonzero marginal cost of carbon component, which is indicative of non-California entities as a whole importing GHG-containing energy into California via the EIM. This is consistent with BPA selling energy to non-California entities in the EIM and not being able to get the price premium associated with the cost of GHG compliance in California. This sensitivity tends to reduce the benefits.

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- **FRST-Only Participation**
  In this sensitivity, we further reduce BPA's Big 10 Hydro participation in EIM to the minimum flexibility needed to pass the Flexible Resource Sufficiency Test (FRST). This limit was determined to be the most representative assumption for minimum flexibility. This sensitivity tends to reduce the benefits.

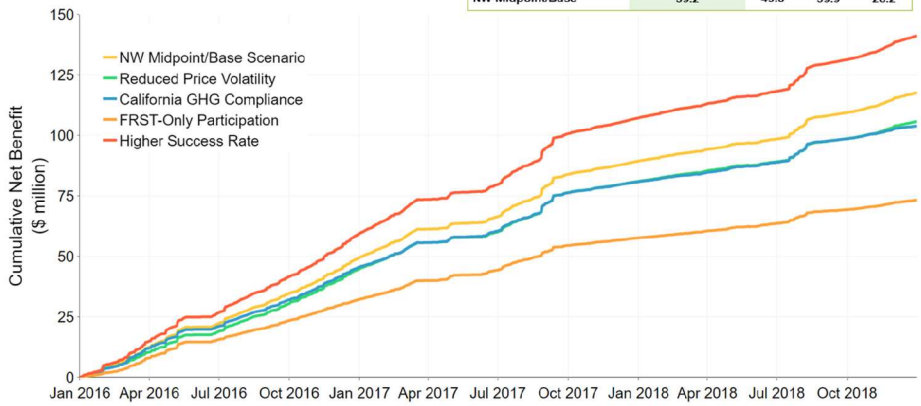
- **Higher Success Rate**
  In this sensitivity, we assume that the success rate for BPA's participation in EIM increases from 75% to 90%. Across the other scenarios and sensitivities, we assume a success rate of 75% to derate the benefits associated with the modeled participation. This success rate may be less than 100% due to imperfect foresight during actual operations. This can encompass situations such as if BPA's bids do not successfully clear the EIM in all intervals, if there is limited market depth at a given price point (e.g., the price decreases due to BPA's marginal participation), or if there are unforeseen hydro constraints that were not captured in the historical spinning capability. This sensitivity tends to increase the benefits.

The first three sensitivities above estimated that benefits would be reduced by between **$4-15 million/year** relative to the NW Midpoint/Base Scenario, reflecting a wider range of plausible pricing and flexibility assumptions for BPA's participation. Meanwhile, increasing success rate increases benefits by the same percentage amount.

BPA-2020-00784-F 0015

Figure 3. Cumulative Gross Dispatch Benefits for Sensitivities

Scenario	Average Revenue ($ million)	Annual Revenue ($ million) 2016	2017	2018
Reduced Price Volatility	35.3	44.9	36.1	24.8
California GHG Compliance	34.6	45.6	34.5	23.8
FRST-Only Participation	24.4	32.3	25.4	15.6
Higher Success Rate	47.1	59.4	47.8	34.0
NW Midpoint/Base	**39.2**	**49.5**	**39.9**	**28.2**



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3 Transmission Benefits

Transmission investments will continue to be an important part of BPA's planning efforts; for example, transmission will be needed to connect new generators and loads as well as replace aging infrastructure. However, in certain situations EIM can provide viable benefits to BPA's transmission customers.

E3 and BPA staff defined two ways in which EIM participation could provide benefits to BPA's transmission customers. These benefits come from the EIM's **security-constrained economic dispatch** (SCED), which optimally manages congestion across the entire market footprint. In both cases, the EIM is useful for addressing short-term, moderate-sized needs and is complementary to the planning and operational tools that BPA employs today:

- Transmission Curtailment
- EIM as a Non-Wires Solution

In situations where system operating limits are at risk of being exceeded, BPA currently may choose to curtail transmission schedules to maintain reliability. Under current practice, schedules are curtailed pro-rata according to NERC Curtailment priorities, which is non-optimal, resulting in more MW of curtailed schedules that is needed to address the local constraint. In contrast, EIM's SCED is designed to incorporate all system operating limits directly into the dispatch

BPA-2020-00784-F 0015

algorithm, creating a lowest-cost dispatch across the entire market footprint that maintains operational feasibility. With the larger market, there is also a larger pool of available resources to maintain system balance, providing a more precise and effective tool for addressing moderately sized transmission constraints.

Table 2. Characteristics of Various Transmission Planning Solutions

	EIM	DR	Storage	Transmission Build
Generation Capacity Value	No	Yes	Yes	No
Energy Value	Yes	Yes	Yes	No
Transmission Capacity Value	Low	Low	Medium	High
Congestion Area	Wide	Local	Local	Local
Congestion Value	High	Medium	Medium	High
Effort to Provision	Low	Medium	Medium	High
Levelized Costs	$	$$	$$$	$$
Call Option Timing	N/A	0-2 Days	0-2 Days	N/A
Response Time	8-12 Minutes	0-18 Hours	0-18 Hours	N/A
Duration	5-240 Minutes	1-360 Minutes	1-480 Minutes	30-50 Years
Uses	Load Service Imbalance Energy Economic Dispatch Congestion Management Renewable Integration Energy Optimization	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services	Load Service Peak Shaving Congestion Management Renewable Integration Ancillary Services Energy Optimization	Load Service Renewable Integration

Table 1 describes the characteristics of various planning solutions for addressing transmission flow relief. Certain solutions provide multiple uses and value streams; for example, demand response and storage can provide generation capacity value while EIM and new transmission do not. Due to the subhourly and voluntary nature of EIM, it cannot be relied upon for hourly resource sufficiency or long-term resource adequacy needs, so investments in other resources within BPA's territory will still be necessary. Similarly, some solutions are faster responding (such as EIM being able to redispatch within minutes compared to day-ahead demand response calls), while others (such as transmission build) are able provide flow relief over multiple decades. No single

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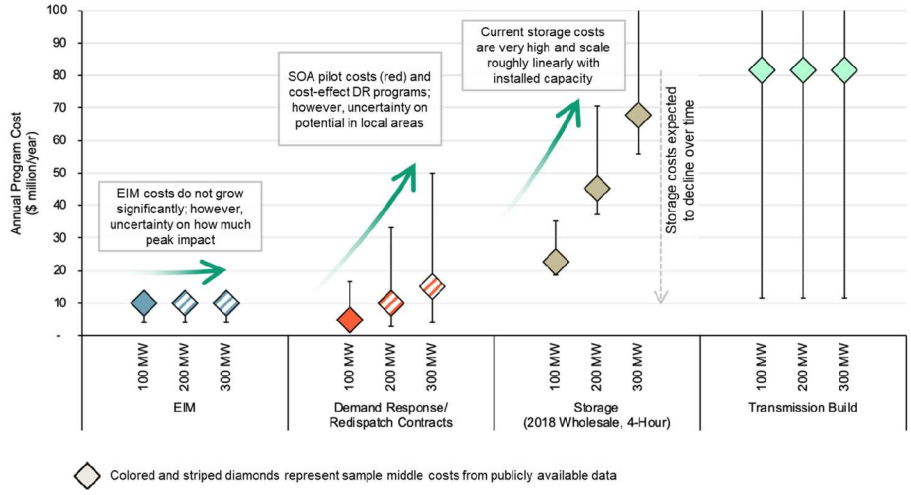
solution described above can provide all the benefits at the lowest for all transmission needs at the lowest cost; the comparison emphasizes that adding new tools to BPA's planning toolkit provides yet another economic solution that can be deployed to serve customers.

Figure 4. Gross Annual Program Cost for Various Transmission Planning Solutions at Illustrative Flow Relief Levels



Using publicly available cost information[5], **Figure 4** compares the **estimated gross annual program costs**[6] for each of the solutions discussed, scaled to illustrative flow relief levels of 100 MW, 200 MW, and 300 MW. The figure shows EIM as possibly providing more than 100 MW of flow relief (dashed

[5] EIM levelized costs come from latest BPA implementation estimates, levelized over 20 years at an 8% discount rate. Redispatch contract costs are based on the South-of-Allston pilot. Demand response cost ranges come from latest BPA DR potentials study and are based on upfront implementation costs; Bonneville expects that levelized costs of an ongoing DR program would be significantly lower than those from the time-limited SOA pilot. Storage costs come from Lazard's Levelized Cost of Storage 4.0 study; these estimates may differ from near-term costs for battery storage projects in BPA's territory. Transmission costs come from recent BPA (proposed) projects.

[6] The **net annual program costs** for various solutions may be lower when considering the other sources of value that each solution can provide. For example, demand response and storage have unique purposes outside of congestion management, such as generation capacity value, which can offset some of the gross program costs.

BPA-2020-00784-F 0015

diamonds) for almost no incremental cost; however, as the need increases, the uncertainty of whether EIM can provide that required relief increases as well. The flatness of gross EIM program costs contrasts with the localized nature of other transmission solutions, which generally scale with size and/or number of load relief areas.

Table 3. Illustrative Quantitative Example of Annual Program Costs

Batteries and Redispatch Case		EIM Case	
100 MW battery @ $226/kW-year	$22.6 million/year	$10 million/year (levelized startup and ongoing costs)	$10 million/year
100 MW Redispatch Contract / DR @ $50/kW-year[7]	+ $5.0 million/year		
Annual Cost	**= $27.6 million/year**		**= $10 million/year**

To illustrate the comparison of gross program costs, **Table 3** presents an example of two potential flowgates, each needing 100 MW of intra-hour flow relief. If we assume that EIM can provide the flow relief needed, the total levelized cost of using EIM is $10 million/year. In contrast, under a business-as-usual case, where BPA may procure a mix of batteries, demand response, and redispatch contracts, the gross program cost would be $27.6 million/year at current costs. Scaling these cases to twice the size—4 flowgates or 200 MW—would result in $55.2 million/year in cost under the example Batteries and Redispatch Case and $10 million/year in the EIM Case. Both cases provide other benefits to BPA's operations that could lower the net cost associated with

[7] The SOA Redispatch Pilot program provided approximately 100 MW of flow relief for ten 4-hour events per year, during summer weekday afternoons, from 200 MW of incremental and 200 MW of decremental capacity based on a prior pre-schedule call option requirement for manual deployment. A longer term (5-7 year) program may have been less expensive on an annual basis.

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BPA-2020-00784-F 0015

providing flow relief; however, this simple quantitative example illustrates that the costs associated with EIM (regardless of how costs are allocated) can be lower than alternative solutions for small- to moderately-sized needs.

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4 Appendix

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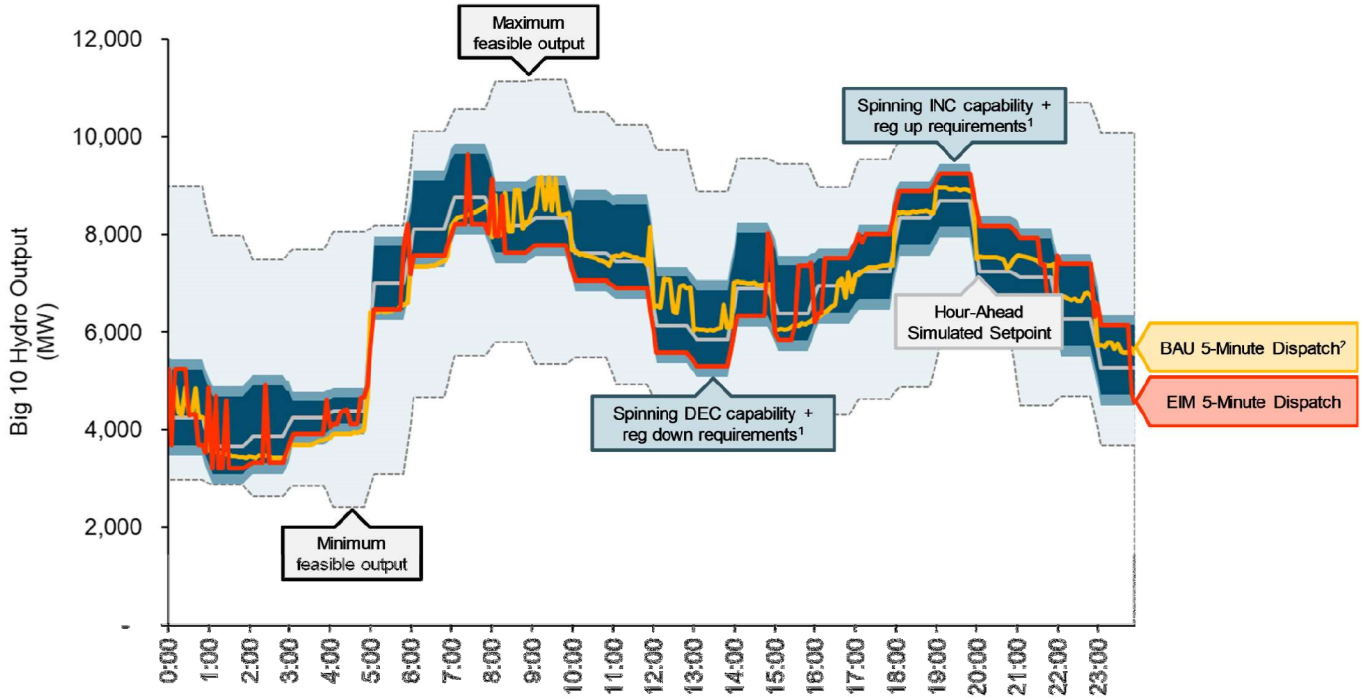
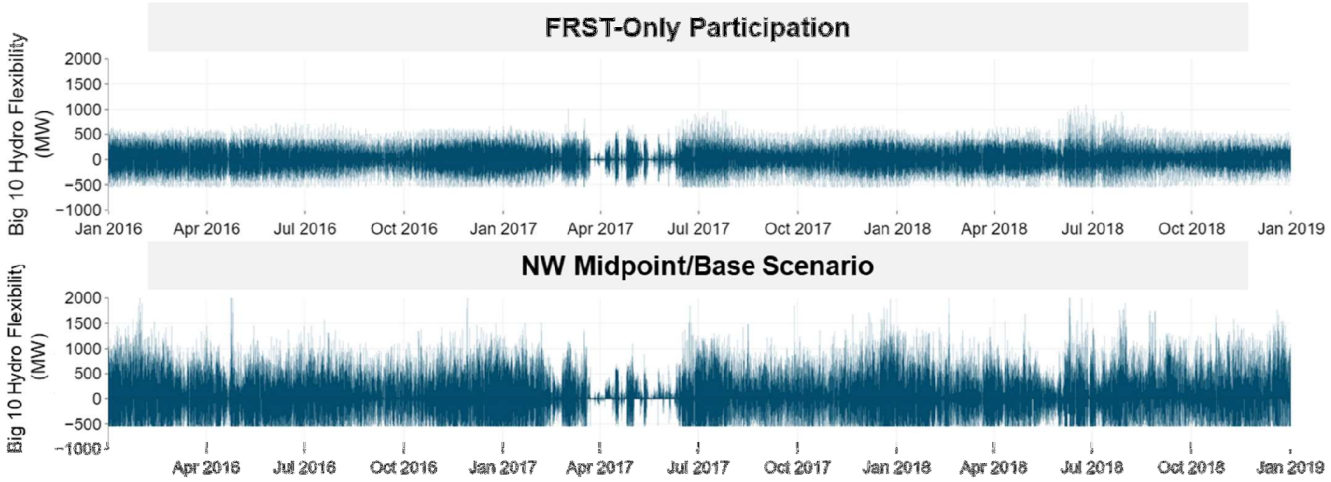
4.1 Example of Big 10 Subhourly Flexibility Under Business-As-Usual (BAU) and EIM Dispatch



[1] Regulating reserve requirements are larger in EIM case than BAU case, resulting in tighter flexibility bounds
[2] BAU dispatch shows subhourly spikes due to balancing net load (load – wind) variability

4.2 Big 10 Hydro Spinning Capability Available for EIM Participation



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4.3 Northwest EIM Price Statistics for 2016-2018 Historical Period

	DGAP_BPAT-APND		DGAP_PACW-APND		DGAP_PGE-APND		DGAP_PSEI-APND	
EIM Market	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***	***15-Minute***	***5-Minute***
Mean ($/MWh)	29.31	28.48	24.37	21.94	26.57	25.86	24.68	23.46
Median ($/MWh)	26.01	24.24	22.66	21.56	24.64	23.22	23.58	22.44
Max ($/MWh)	1,189.40	1,112.64	1,004.51	1,184.21	1,061.71	1,256.62	1,104.54	1,477.32
Min ($/MWh)	-176.44	-371.9	-1,892.05	-1,037.59	-155.67	-374.77	-201.03	-321.19
>$100/MWh (hours)	189	272	103	103	118	197	110	139
<-$100/MWh (hours)	1	6	12	44	2	9	46	69

4.4 Sensitivity Assumptions

Sensitivity	NW Midpoint Assumption	More Optimistic	More Conservative
Success Rate	• 75%	• Higher success rate: Better foresight on hydro operations and success in being awarded bids at modeled price	• Lower success rate: Hydro is more constrained than expected or bids are not successfully awarded to BPA
Hydro Flexibility	• Actual "Big 10" Hydro INC/DEC spinning capability • Daily hydro energy balance • BPA meets FRST in all hours	• Use hydro capability beyond spinning capability on "Big 10" Hydro • Optimize FCRPS to increase available capability for EIM transactions • Allow hydro to be balanced across multiple days	• Limiting available spinning capability for EIM participation e.g. no participation beyond what is required for FRST only
EIM Price	• 2016-2018 PGE prices	• Historical DGAP_BPAT-APND prices are more volatile	• PSE prices are on average lower and less volatile • NW average prices would decrease overall price volatility
EIM Intra-Hour Price Volatility	• Actual volatility of 2016-2018 PGE prices	• Price volatility within the hour will stay the same	• Price volatility within the hour is reduced due to higher EIM participation
California GHG Fee	• No marginal cost of GHG considered in EIM prices	• n/a	• EIM prices are reduced when increasing generation during intervals of nonzero marginal cost of GHG

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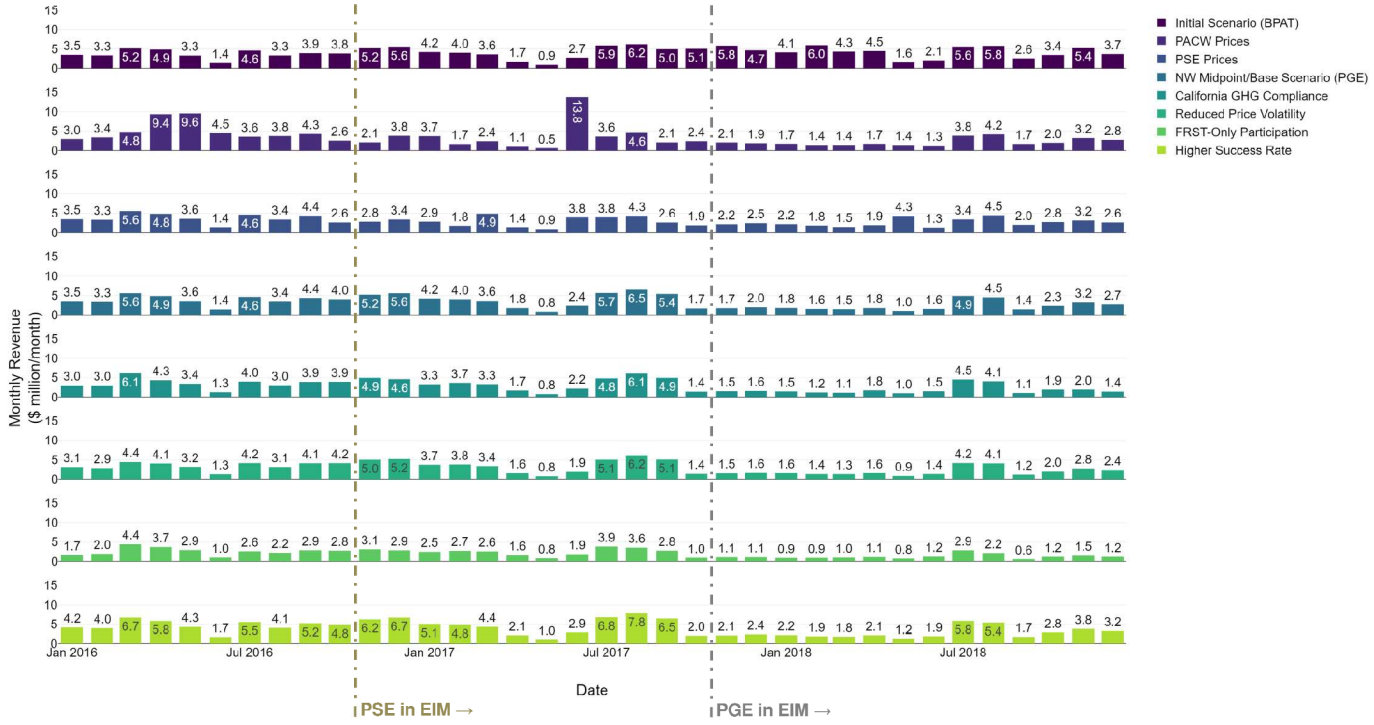
4.5 Monthly Revenues by Scenario



4.6 Average Simulated EIM Transfers by Scenario

	Sales (INC)		Purchases (DEC)	
Market	***15-Minute*** (average MW)	***5-Minute*** (average MW)	***15-Minute*** (average MW)	***5-Minute*** (average MW)
BPAT Prices (Initial Scenario)	232.2	164.6	233.7	169.9
PACW Prices	237.0	174.2	240.2	192.1
PSE Prices	230.8	164.2	233.2	168.7
NW Midpoint/Base Scenario	**231.9**	**161.4**	**232.6**	**166.0**
California GHG Compliance	202.6	132.5	203.3	137.3
Reduced Price Volatility	228.8	156.5	227.5	160.1
FRST-Only Participation	158.0	123.5	158.8	128.1
Higher Success Rate	231.9	161.4	232.6	166.0

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Attachment C

Draft Implementation Agreement

ENERGY IMBALANCE MARKET IMPLEMENTATION AGREEMENT

This Implementation Agreement ("Agreement") is entered into as of [DATE], by and between the United States of America, Department of Energy, acting by and through the Bonneville Power Administration ("Bonneville"), and the California Independent System Operator Corporation, a California nonprofit public benefit corporation ("ISO"). Bonneville and the ISO are sometimes referred to in the Agreement individually as a "Party" and, collectively, as the "Parties."

RECITALS

A. WHEREAS, Bonneville is a federal power marketing administration that markets electric power from multiple generating resources, including but not limited to the Federal Columbia River Power System owned and operated by the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation, and the Columbia Generating Station owned and operated by Energy Northwest;

B. WHEREAS, Bonneville also owns and/or operates a high voltage transmission system in the Pacific Northwest (the Federal Columbia River Transmission System) and a balancing authority area;

C. WHEREAS, Bonneville has determined there is an opportunity to secure benefits for Bonneville's customers through improved dispatch and operation of the Federal Columbia River Power System and through the efficient use and continued reliable operation of existing and future transmission facilities and desires to participate in the energy imbalance market operated by the ISO ("EIM");

D. WHEREAS, the ISO has determined there are benefits to ISO market participants through greater access to energy imbalance resources in real-time and through the efficient use and reliable operation of the transmission facilities and markets operated by the ISO, and desires to expand operation of the EIM to include Bonneville;

E. WHEREAS, Bonneville acknowledges that the rules and procedures governing the EIM are set forth in the provisions of the ISO tariff as filed with the Federal Energy Regulatory Commission ("FERC") and that participation in the EIM requires corresponding revisions to Bonneville's rate schedules and Open Access Transmission Tariff ("Bonneville Tariff");

F. WHEREAS, Bonneville's decision to participate voluntarily in the EIM is within Bonneville's sole discretion, and Bonneville will only participate in the EIM so long as such participation is on a voluntary basis and on terms and conditions acceptable to Bonneville, including Bonneville's unilateral right to terminate this Agreement as set forth below;

G. WHEREAS, Bonneville's EIM implementation and participation is limited to the scope of the EIM at the time this Agreement becomes effective pursuant to Section 1

below. Bonneville is under no obligation to participate in any expanded EIM markets (*e.g.*, day-ahead); and

H. WHEREAS, the Parties are entering into this Agreement to set forth the terms upon which the ISO will timely configure its systems to incorporate Bonneville into the EIM ("Project") on or before March 1, 2022 ("Implementation Date").

NOW THEREFORE, in consideration of the mutual covenants contained herein, and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

AGREEMENT

1. Effective Date, Term, and Bonneville's Non-Jurisdictional Status.

(a) This Agreement shall become effective upon the date the Agreement is accepted, approved or otherwise permitted to take effect by FERC, without condition or modification unsatisfactory to either Party ("Effective Date").

(b) In the event FERC requires any modification to the Agreement or imposes any other condition upon its acceptance or approval of the Agreement, each Party shall have ten (10) business days to notify the other Party that any such modification or condition is unacceptable to that Party. If no Party provides such notice, then the Agreement, as modified or conditioned by FERC, shall take effect as of the date determined under Section 1(a). If either Party provides such notice to the other Party, the Parties shall take any one or more of the following actions: (i) meet and confer and agree to accept any modifications or conditions imposed by such FERC order; (ii) jointly seek further administrative or legal remedies with respect to such FERC order, including a request for rehearing or clarification; or (iii) enter into negotiations with respect to accommodation of such FERC order, provided however, if the Parties have not agreed to such an accommodation within thirty (30) calendar days after the date on which such FERC order becomes a final and non-appealable order, such order shall be deemed an adverse order and the Parties shall have no further rights and obligations under the Agreement.

(c) The term of the Agreement ("Term") shall commence on the Effective Date and shall terminate upon the earliest to occur of (1) the date all necessary revisions to the Bonneville Tariff, Bonneville's rate schedules, and the ISO tariff necessary for the commencement of Bonneville's participation in the EIM have taken effect (when the market becomes financially binding on transactions within Bonneville's balancing authority area); (2) termination in accordance with Section 2 of this Agreement; or (3) such other date as mutually agreed to by the Parties ("Termination Date").

(d) This Agreement shall automatically terminate on the Termination Date and shall have no further force or effect, provided that the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as provided therein.

(e) The ISO acknowledges that Bonneville is a non-jurisdictional utility described in section 201(f) of the Federal Power Act, 16 U.S.C. 824(f), and respects Bonneville's interest in remaining so. Nothing in this Agreement or subsequent EIM-related agreements is intended to create additional FERC jurisdiction for Bonneville, nor shall it be construed in a manner that creates additional FERC jurisdiction for Bonneville.

2. Termination.

(a) The Parties may mutually agree to terminate this Agreement in writing at any time. In addition, either Party may terminate this Agreement in its sole discretion after conclusion of the negotiation period in Section 2(b) or as provided in Section 2(d) or 2(e) as applicable.

(b) If either the ISO or Bonneville seeks to unilaterally terminate this Agreement, it must first notify the other Party in writing of its intent to do so ("Notice of Intent to Terminate") and engage in thirty (30) calendar days of good faith negotiations in an effort to resolve its concerns. If the Parties successfully resolve the concerns of the Party issuing the Notice of Intent to Terminate, the Party that issued such notice shall notify the other Party in writing of the withdrawal of such Notice ("Notice of Resolution").

(c) At the time the Notice of Intent to Terminate is provided, or any time thereafter unless a Notice of Resolution is issued, Bonneville may provide written notice directing the ISO to suspend performance on any or all work on the Project for a specified period of time ("Notice to Suspend Work"). Upon receipt of a Notice to Suspend Work, the ISO shall: (1) discontinue work on the Project; (2) place no further orders with subcontractors related to the Project; (3) take commercially reasonable actions to suspend all orders and subcontracts; (4) protect and maintain the work on the Project; and (5) otherwise mitigate Bonneville's costs and liabilities for the areas of work suspended. The ISO will not invoice Bonneville pursuant to Section 4(c) of this Agreement for any milestone payment following the issuance of a Notice to Suspend Work. To the extent a Notice of Resolution is issued pursuant to Section 2(b), the Notice to Suspend Work in effect at the time shall be deemed withdrawn and the ISO shall be entitled to invoice Bonneville for any milestone completed as specified in Section 4(c) of this Agreement and Bonneville shall pay such invoice pursuant to Section 4.

(d) Any time after thirty (30) calendar days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a Notice of Resolution, the ISO may terminate this Agreement by providing written notice to Bonneville that it is terminating this Agreement ("Termination Notice") effective immediately. The ISO may terminate this Agreement under the terms of this Section 2(d) at its sole discretion for any reason.

(e) Any time after thirty (30) calendar days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a

Notice of Resolution, Bonneville may terminate this Agreement by providing written notice to the ISO that it is terminating this Agreement ("Termination Notice") effective immediately. Bonneville may terminate this Agreement under the terms of this Section 2(e) at its sole discretion for any reason.

(f) In the event this Agreement is terminated by either or both of the Parties pursuant to its terms, this Agreement will become wholly void and of no further force and effect, without further action by either Party, and the liabilities and obligations of the Parties hereunder will terminate, and each Party shall be fully released and discharged from any liability or obligation under or resulting from this Agreement as of the date of the Termination Notice provided in Section 2(d) or 2(e), as applicable, notwithstanding the requirement for the ISO to submit the filing specified in Section 2(g). Notwithstanding the foregoing, the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as specified in Sections 5 and 6, and any milestone payment obligation pursuant to Section 4(c) that arose prior to the Termination Notice in accordance with Section 2(d) or 2(e) shall survive until satisfied or resolved in accordance with Section 11.

(g) The Parties acknowledge that the ISO is required to file a notice of termination with FERC.

3. Implementation Scope and Schedule.

(a) The Parties shall complete the Project as described in Exhibit A, subject to modification only as described in Section 4(e) below.

(b) The Parties shall undertake the activities described in Exhibit A with the objective of completing the Project and implementing the EIM no later than the Implementation Date, including all milestones listed under Exhibit A for the Implementation Date, subject to modification only as described in Section 3(c) below.

(c) Either Party may propose a change in Exhibit A or the Implementation Date to the other Party. If a Party proposes a change in Exhibit A or the Implementation Date, the Parties shall negotiate in good faith to attempt to reach agreement on the proposal and any necessary changes in Exhibit A and any other affected provision of this Agreement, provided that any change in Exhibit A, or any change to the Implementation Date, must be mutually agreed to by the Parties. The agreement of the Parties to a change in Exhibit A, or a change to the Implementation Date, shall be memorialized in a revision to Exhibit A, which will then be binding on the Parties and shall be posted on the internet web sites of the ISO and Bonneville, without the need for execution of an amendment to this Agreement. Changes that require revision of any provision of this Agreement other than Exhibit A shall be reflected in an executed amendment to this Agreement and filed with FERC for acceptance.

(d) At least once per calendar month during the Term, the Parties' Designated Executives, or their designees, will meet telephonically or in person (at a mutually agreed to location) to discuss the status of the performance of the tasks necessary to

achieve the milestones in Exhibit A and the continued appropriateness of Exhibit A to ensure that the Project can meet the Implementation Date. For purposes of this section, "Designated Executive" shall mean the individual identified in Section 8(g), or her or his designee or successor.

4. Implementation Charges, Invoicing and Milestone Payments.

(a) As itemized in Section 4(c) below, Bonneville shall pay the ISO a fixed fee of $1,870,000 for costs incurred by the ISO to implement the Project ("Implementation Fee"), subject to completion of the milestones specified in Section 4(c) and subject to adjustment only as described in Section 4(b).

(b) The ISO will provide prompt written notice to Bonneville when the sum of its actual costs through the date of such notice and its projected costs to accomplish the balance of the Project exceed the Implementation Fee. The Implementation Fee shall be subject to adjustment only by mutual agreement of the Parties if the Parties agree to a change in Exhibit A, or a change to the Implementation Date, in accordance with Section 3(c) and the Parties agree that an adjustment to the Implementation Fee is warranted in light of such change.

(c) For each milestone described in Exhibit A, the ISO shall invoice Bonneville for 1/6th of the Implementation Fee as follows:

i. $311,650 upon the Effective Date as described in Section 1 of this Agreement for Milestone 1;

ii. $311,650 upon completion of detailed Project Management Plan for Milestone 2;

iii. $311,650 upon ISO promotion of market model including the Bonneville area market data to the market simulation non-production system, and allowing Bonneville to start connectivity testing and exchange data in advance of market simulation for Milestone 3;

iv. $311,650 upon the conclusion of day-in-life simulation, and start of EIM market simulation for Milestone 4;

v. $311,700 upon the start of full 24/7 parallel operations for Milestone 5; and

vi. $311,700 upon the first production Bonneville EIM trade date for Milestone 6.

(d) Following the completion of each milestone identified in Section 4(c)(i) through (vi), the ISO will deliver to Bonneville an invoice which will show the amount due. The invoice shall contain information specified in 5 C.F.R. § 1315.9(b) and shall contain reasonable documentation supporting the completion of the milestone being invoiced. Bonneville shall pay the invoice no later than forty-five (45) calendar days

after the date of receipt. Any milestone payment past due will accrue interest, per annum, calculated in accordance with 5 C.F.R. § 1315.10.

(e) If a milestone has not been completed as described in Section 4(c)(i), (ii), (iii), (iv), or (v) and in Exhibit A, as Exhibit A may have been modified in accordance with Section 3(c), the Parties shall negotiate in good faith an agreed upon change to the Project Delivery Dates (as defined in Exhibit A) consistent with Section 3(c) such that the timing of milestone payments in Section 4(c) can be adjusted to correspond to the updated Exhibit A.

(f) If Bonneville disputes any portion of any amount specified in an invoice delivered by the ISO in accordance with Section 4(c), Bonneville shall pay its total amount of the invoice when due, and identify the disputed amount and state that the disputed amount is being paid under protest. Any disputed amount shall be resolved pursuant to the provisions of Section 11. If it is determined pursuant to Section 11 that an overpayment or underpayment has been made by Bonneville or any amount on an invoice is incorrect, then (i) in the case of any overpayment, the ISO shall promptly return the amount of the overpayment (or credit the amount of the overpayment on the next invoice) to Bonneville; and (ii) in the case of an underpayment, Bonneville shall promptly pay the amount of the underpayment to the ISO. Any overpayment or underpayment shall include interest for the period from the date of overpayment, underpayment, or incorrect allocation, until such amount has been paid or credited against a future invoice calculated in the manner prescribed for calculating interest in Section 4(d).

(g) All costs necessary to implement the Project not provided for in this Agreement shall be borne separately by each Party, which in the case of the ISO will be recovered through rates as may be authorized by its regulatory authorities.

(h) All milestone payments required to be made under the terms of this Agreement shall be made to the account or accounts designated by the Party which the milestone payment is owed, by wire transfer (in immediately available funds in the lawful currency of the United States).

5. Confidentiality.

(a) All written or oral information received from the other Party in connection with this Agreement (but not this Agreement after it is filed with FERC) necessary to complete the Project and marked or otherwise identified at the time of communication by such Party as containing information that Party considers commercially sensitive or confidential shall constitute "Confidential Information" subject to the terms and conditions herein.

(b) If Bonneville publicly releases Bonneville's Confidential Information in connection with a public process or a regulatory filing, or if the ISO publicly releases the ISO's Confidential Information in connection with a public process or a regulatory filing, then the information released shall no longer constitute Confidential Information;

provided, however, that Confidential Information disclosed under seal (or in such other manner as to be treated confidentially) in connection with a regulatory filing shall retain its status as Confidential Information under this Agreement. In addition, Confidential Information does not include information that (i) is or becomes generally available to the public other than as a result of disclosure by either Party, its officers, directors, employees, agents, or representatives; (ii) is or becomes available to such Party on a non-confidential basis from other sources or their agents or representatives when such sources are not known by such Party to be prohibited from making the disclosure; (iii) is already known to such Party or has been independently acquired or developed by such Party without violating any of such Party's obligations under this Section 5; (iv) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, with regard to information for discussion at any stakeholder meetings or during the stakeholder process or with any regulatory authority; or (v) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, to allow for such disclosure and designation as non-confidential or public information on a case-by-case basis in accordance with Section 10 of this Agreement.

(c) The Confidential Information will be kept confidential by each Party and each Party agrees to protect the Confidential Information using the same degree of care, but no less than a reasonable degree of care, as a Party uses to protect its own confidential information of a like nature. Notwithstanding the preceding sentence, a Party may disclose the Confidential Information or portions thereof to those of such Party's officers, employees, partners, representatives, attorneys, contractors, advisors, or agents who need to know such information for the purpose of analyzing or performing an obligation related to the Project. Notwithstanding the foregoing, a Party is not authorized to disclose such Confidential Information to any officers, employees, partners, representatives, attorneys, contractors, advisors, or agents without (i) informing such officer, employee, partner, representative, attorney, contractor, advisor, or agent of the confidential nature of the Confidential Information and (ii) ensuring that such officer, employee, partner, representative, attorney, contractor, advisor, or agent is subject to confidentiality duties or obligations to the applicable Party that are no less restrictive than the terms and conditions of this Agreement. Each Party agrees to be responsible for any breach of this Section 5 by such Party or a Party's officers, employees, partners, representatives, attorneys, contractors, advisors or agents, subject to the limitations set forth in Section 6 below.

(d) In the event that a Party is required by a court of competent jurisdiction, applicable law, including, but not limited to, the Freedom of Information Act, 5 U.S.C. § 552, or regulatory authority (by rule, regulation, order, deposition, interrogatory, request for documents, data request issued by a regulatory authority, subpoena, civil investigative demand or similar request or process) to disclose any of the Confidential Information, such Party shall (to the extent legally permitted) provide the other Party with prompt written notice of such requirement so that the other Party may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Section 5. In the event that such protective order or other remedy is not obtained,

the disclosing Party hereby waives compliance with the provisions hereof with respect to such Confidential Information. In such event, the Party compelled to disclose shall (i) furnish only that portion of the Confidential Information which is legally required to be furnished, and (ii) exercise reasonable efforts to obtain assurances that confidential treatment will be accorded the Confidential Information so furnished.

(f) Either Party may seek damages or other remedies permitted by applicable law if a Party breaches this Section 5, however, the Parties will first seek to resolve any dispute regarding disclosure arising under this Section 5 by mutual agreement, subject to the limitations set forth in Section 6 below.

(g) Upon written request by a Party, the other Party shall promptly return to the requesting Party or destroy all Confidential Information it received, including all copies of its analyses, compilations, studies or other documents prepared by or for it, that contain the Confidential Information in a manner that would allow its extraction or that would allow the identification of the requesting Party as the source of the Confidential Information or inputs to the analysis. Notwithstanding the foregoing, a Party shall not return or destroy the other Party's Confidential Information if a third party is seeking such information under section 5(d) of this Agreement, and neither Party shall be required to destroy or alter any computer archival and backup tapes or archival and backup files (collectively, "Computer Tapes"), provided that such Computer Tapes shall be kept confidential in accordance with the terms of this Agreement.

(h) Nothing in this Agreement shall be deemed to restrict either Party from engaging with third parties with respect to any matter and for any reason, specifically including the EIM, provided Confidential Information is treated in accordance with this Section 5.

(i) This Section 5, Confidentiality, applies for two years (24 months) after the Termination Date or the date of any expiration or termination of this Agreement.

6. Limitation of Liability.

(a) The Parties acknowledge and agree that, except as otherwise specified in Sections 4(f) and 6 (b) of this Agreement, neither Party shall be liable to the other Party for any claim, loss, cost, liability, damage or expense, including any direct damage or any special, indirect, exemplary, punitive, incidental or consequential loss or damage (including any loss of revenue, income, profits or investment opportunities or claims of third party customers), arising out of or directly or indirectly related to such other Party's decision to enter into this Agreement, such other Party's performance under this Agreement, or any other decision by such Party with respect to the Project.

(b) Claims for property damage, personal injury and death against Bonneville must be brought under the Federal Tort Claims Act, 28 U.S.C. 2671 et seq. Within the limitations of applicable law, the ISO shall be responsible for injuries and damages to third-parties caused by its negligence, intentional misconduct, or breach of this Agreement.

(c) The rights and obligations under this Section 6 shall survive the Termination Date and any expiration or termination of this Agreement.

7. Representation and Warranties.

(a) Representations and Warranties of Bonneville. Bonneville represents and warrants to the ISO as of the Effective Date as follows:

(1) It is duly formed under federal law.

(2) It has all requisite statutory authority necessary to carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary statutory authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organic statutes; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms.

(b) Representations and Warranties of the ISO. The ISO represents and warrants to Bonneville as of the Effective Date as follows:

(1) It is duly formed, validly existing and in good standing under the laws of the jurisdiction of its formation.

(2) It has all requisite corporate power necessary to own its assets and carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary corporate power and authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized by all necessary corporate action on its part.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organizational documents; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms, except as the same may be limited by bankruptcy, insolvency, regulatory authority, or other similar laws affecting creditors' rights generally and by principles of equity regardless of whether such principles are considered in a proceeding at law or in equity.

(6) All material governmental authorizations in connection with the due execution and delivery of, and performance by it of its obligations under this Agreement, have been duly obtained or made prior to the date hereof and are in full force and effect.

8. General Provisions.

(a) This Agreement, including Exhibit A and Exhibit B to this Agreement, constitutes the entire agreement between the Parties, and supersedes any prior written or oral agreements or understandings between the Parties, relating to the subject matter of this Agreement; provided, that nothing in this Agreement shall limit, repeal, or in any manner modify the existing legal rights, privileges, and duties of each of the Parties as provided by any other agreement between the Parties, or by any statute or any other law or applicable court or regulatory decision by which such Party is bound.

(b) This Agreement may not be amended except in writing hereafter signed by both of the Parties; provided, however, the Parties may mutually agree to changes in Exhibit A in accordance with Section 4(e).

(c) Any waiver by a Party to this Agreement of any provision or condition of this Agreement must be in writing signed by the Party to be bound by such waiver, shall be effective only to the extent specifically set forth in such writing and shall not limit or affect any rights with respect to any other or future circumstance.

(d) This Agreement is for the sole and exclusive benefit of the Parties and shall not create a contractual relationship with, or cause of action in favor of, any third party.

(e) Neither Party shall have the right to voluntarily assign its interest in this Agreement, including its rights, duties, and obligations hereunder, without the prior written consent of the other Party, which consent may be withheld by the other Party in its sole and absolute discretion. Any assignment made in violation of the terms of this Section 8(e) shall be null and void and shall have no force and effect.

(f) In the event that any provision of this Agreement is determined to be invalid or unenforceable for any reason, in whole or part, the remaining provisions of this Agreement shall be unaffected thereby and shall remain in full force and effect to the fullest extent permitted by law, and such invalid or unenforceable provision shall be replaced by the Parties with a provision that is valid and enforceable and that comes closest to expressing the Parties' intention with respect to such invalid or unenforceable provision.

(g) Whenever this Agreement requires or provides that (i) a notice be given by a Party to the other Party or (ii) a Party's action requires the approval or consent of the other Party, such notice, consent or approval shall be given in writing and shall be given by personal delivery, by recognized overnight courier service, email or by certified mail (return receipt requested), postage prepaid, to the recipient thereof at the address given for such Party as set forth below, or to such other address as may be designated by notice given by any Party to the other Party in accordance with the provisions of this Section 8(g):

If to Bonneville:

Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621
Attention: Steve Kerns, Director Grid Modernization and EIM
E-mail: srkerns@bpa.gov

If to the ISO:

California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Attention: Petar Ristanovic, Vice President, Technology
E-mail:PRistanovic@caiso.com

Each notice, consent or approval shall be conclusively deemed to have been given (i) on the day of the actual delivery thereof, if given by personal delivery, email sent by 5:00 p.m., or overnight delivery, or (ii) date of delivery shown on the receipt, if given by certified mail (return receipt requested). It is the responsibility of each Party to provide, in accordance with this Section, notice to the other Party of any necessary change in the contact or address information herein.

(h) This Agreement may be executed in one or more counterparts (including by facsimile or a scanned image), each of which when so executed shall be deemed to be an original, and all of which shall together constitute one and the same instrument.

(i) Nothing contained in this Agreement shall be construed as creating a corporation, company, partnership, association, joint venture or other entity with the other Party, nor shall anything contained in this Agreement be construed as creating or requiring any fiduciary relationship between the Parties. No Party shall be responsible hereunder for the acts or omissions of the other Party.

(j) The decision to execute an EIM service agreement and participate in the EIM remains within the sole discretion of Bonneville and the decision whether to continue to offer EIM services (subject to Sections 1(c) and 2) remains within the sole discretion of the ISO.

(k) Nothing in this Agreement shall preclude a Party from exercising any rights or taking any action (or having its affiliates take any action) with respect to any other project.

(l) Unless otherwise expressly provided, for purposes of this Agreement, the following rules of interpretation shall apply: (i) any reference in this Agreement to gender includes all genders, and the meaning of defined terms applies to both the singular and the plural of those terms; (ii) the insertion of headings are for convenience of reference only and do not affect, and will not be utilized in construing or interpreting, this Agreement; (iii) all references in this Agreement to any "Section" are to the corresponding Section of this Agreement unless otherwise specified; (iv) words such as "herein," "hereinafter," "hereof," and "hereunder" refer to this Agreement (including Exhibit A to this Agreement) as a whole and not merely to a subdivision in which such words appear, unless the context otherwise requires; (v) the word "including" or any variation thereof means "including, without limitation" and does not limit any general statement that it follows to the specific or similar items or matters immediately following it; and (vi) the Parties have participated jointly in the negotiation and drafting of this Agreement and, in the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as jointly drafted by the Parties and no presumption or burden of proof favoring or disfavoring any Party will exist or arise by virtue of the authorship of any provision of this Agreement.

9. Governing Law; Venue. This Agreement shall be governed by, and construed and interpreted in accordance with, federal law. Venue for any action hereunder shall be FERC, where subject to its jurisdiction, or otherwise any federal court with jurisdiction.

10. Communication. The Parties shall develop a communication protocol for the dissemination of material information associated with the Project, which shall be approved by Bonneville and the ISO.

11. Dispute Resolution. Unless otherwise provided herein, each of the provisions of this Agreement shall be enforceable independently of any other provision of this Agreement and independent of any other claim or cause of action. In the event of any dispute arising under this Agreement, the Parties shall, to the extent practicable, first attempt to resolve the matter through direct good faith negotiation between the Parties, including a full opportunity for escalation to executive management within the Parties' respective organizations. If the Parties are unable to resolve the issue within thirty (30) calendar days after such escalation of the dispute, then for matters subject to FERC jurisdiction either Party shall have the right to file a complaint under Section 206 of the Federal Power Act. For all other matters, the Parties may pursue litigation in a federal court with jurisdiction over the Parties.

12. Third Party Agreements. The Parties may engage in discussions with third parties, either jointly or unilaterally, to facilitate the Project. Each Party may adopt or modify tariffs or enter into or modify binding agreements between such Party and third

parties to implement the approved terms and conditions of the Project or EIM as necessary and appropriate.

13. Compliance.

(a) Each Party shall comply with all applicable federal, state, local or municipal governmental authority; any governmental, quasi-governmental, regulatory or administrative agency, commission, body or other authority entitled to exercise any administrative, executive, judicial, legislative, policy, regulatory or taxing authority or power, including FERC, NERC, WECC; or any court or governmental tribunal, having jurisdiction over the Party in connection with the execution, delivery and performance of its obligations under this Agreement.

(b) This Agreement is not intended to modify, change or otherwise amend the Parties' current functional responsibilities associated with compliance with WECC and NERC Reliability Standards; provided, however, the Parties may enter into separate mutually agreed to arrangements to clarify roles and responsibilities associated with compliance with WECC and NERC Reliability Standards in respect of this Agreement.

14. Bonneville's EIM Implementation and Participation Principles. The Parties recognize the following principles regarding implementation of the Project and Bonneville's potential participation in the EIM.

(a) Statutory, Regulatory, and Contractual Requirements. Bonneville's EIM implementation and participation will be consistent with its statutory, regulatory, and contractual requirements.

(b) Voluntary Market Participation. Bonneville's EIM participation will include voluntary market entry and exit, voluntary bid and offer volumes and pricing, voluntarily making transmission available for EIM Transfers and the ability to voluntarily forego engaging in EIM Transfers in one or more specified operating intervals consistent with the ISO tariff and the Bonneville Tariff.

(c) Reliability and Operation of the Federal Power and Transmission Systems. Bonneville will continue to be responsible for the reliable operation of the Federal Columbia River Power System and the Federal Columbia River Transmission System. Notwithstanding the ISO's resource sufficiency requirements for the EIM, Bonneville will retain the exclusive right to determine what is required to maintain reliability within its balancing authority area and on its transmission system. The Parties will work in good faith during implementation to ensure that Bonneville's EIM participation will not interfere with Bonneville's existing reliability tools.

(d) Federal Generation Participation. Bonneville may utilize the ISO's resource aggregation models to participate in the EIM as permitted by the

ISO's Business Practice Manuals. If Bonneville chooses to use an available resource aggregation model, Bonneville will identify its aggregated participating resources, aggregated non-participating resources, and other resources in the ISO's master file.

(e) Automation Support. In order to effectively participate in the EIM and ensure both reliable and economic outcomes, Bonneville will endeavor during implementation to automate interactions with existing EIM user interfaces based on the ISO's technical specifications. The ISO will assist Bonneville based on jointly determined requirements, feasibility and cost by 1) providing Application Programming Interfaces to interactions with existing EIM user interfaces, and 2) system or tool enhancements as jointly agreed.

(f) Greenhouse Gas Attributes. If Bonneville elects to allow its EIM transfers to be delivered to California, the transfers will be consistent with the Cap and Trade program administered by the California Air Resources Board, which may include Bonneville's status as an Asset Controlling Supplier.

(g) Base Schedule Submission Timeframes. Prior to the Implementation Date, the ISO will pursue, involving Bonneville and other stakeholders, moving the market closing timeline for financially binding hourly resource plans from T-40 to T-30. In addition, the ISO will explore with Bonneville and other stakeholders other potential enhancements to the EIM fifteen minute market timelines.

(h) Consideration of Other EIM Enhancements. Prior to the Implementation Date, Bonneville will propose in the appropriate ISO process(es) or forum(s), and the ISO will consider, certain EIM enhancements that:

i. improve the accuracy of hourly resource plans;

ii. permit resource sufficiency obligation transfers, *e.g.*, bid range transfers;

iii. improve the flexible ramping sufficiency test through various mechanisms, including but not limited to incorporation of renewable generation forecasts into the flexible ramping requirement computation; and

iiii. increase transparency of data required for the validation of EIM settlement statements.

IN WITNESS WHEREOF, each of the Parties has caused its duly authorized officer to execute this Implementation Agreement as of the date first above written.

BONNEVILLE POWER ADMINISTRATION

By: _____
Name: Janet C. Herrin
Title: Chief Operating Officer

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

By: _____
Name: Petar Ristanovic
Title: Vice President, Technology

EXHIBIT A: PROJECT SCOPE AND SCHEDULE

The Project consists of the activities and delivery dates identified in this Exhibit A, implemented in accordance with the Agreement. The Parties have included a schedule for the Implementation Date to coordinate their efforts required for completion of the Project on a milestone track.

The ISO shall invoice Bonneville for each of the milestones described below pursuant to section 4(c) of the Agreement.

The Parties understand that input received from stakeholders during the course of implementing the Project, conditions imposed or questions raised in the regulatory approval process, and the activities of the Parties in implementing the Project may cause the Parties to determine that changes in the Project are necessary or desirable. Accordingly, this Exhibit A may be modified in accordance with Section 3(c) of the Agreement.

Each Party is responsible for performing a variety of tasks necessary to achieve the milestones on the scheduled dates specified in the table below ("Timeframe") and shall plan accordingly. The Parties shall communicate and coordinate as provided in the Agreement to support the planning and execution to complete the Project.

Project Scope and Milestones	Timeframe
Milestone 1 – Effective Date. Upon the Effective Date of the Implementation Agreement as described in Section 1 of this Agreement.	September 2019 – December 2019
Milestone 2—Detailed Project Management Plan. The Parties will develop and initiate a project management plan that describes specific project tasks each Party must perform, delivery dates, project team members, meeting requirements, and a process for approving changes to support completion of the Project. This phase will include a detailed IT system review to assist Bonneville in development of a detailed metering plan, bidding and billing system(s), and coordination with Bonneville EMS upgrade(s). Work will be initiated on the Bonneville staff training program using the foundational and detailed system computer-based training modules, as well as on the resource data templates needed during Milestone 2.	October 2019- April 2020
Milestone 3— System Implementation and Connectivity Testing for Market Model. Upon ISO promotion of market network model including the Bonneville area to the non-production system, and allowing Bonneville to connect and exchange data in advance of market simulation.	May 2020- June 2021
Milestone 4— Market Simulation. Completion of day-in-life simulation, and start of market simulation scenarios.	June 2021- November 2021

Project Scope and Milestones	Timeframe
Milestone 5— Start of Parallel Operations. The ISO will activate a parallel operation environment to practice production grade systems integration as well as market processes and operating procedures in anticipation of the impending Bonneville activation as an EIM Entity and to confirm compliance with the EIM readiness criteria set forth in the ISO tariff. This milestone will include the following: • Staged Weekday/Weekend/Weeknight (in progressive sequence) operations with considerations of minimum support during holiday periods; and • Full 24/7 operations.	December 2021-February 2022
Milestone 6—System Deployment and Go Live no later than 3/2/2022. Implementing the Project and going live will include resource registration, operating procedures and updates, execution of service agreements, completion of the Bonneville tariff process, applicable board approvals, the filing and acceptance of service agreements and tariff changes with FERC, and completion and filing of a readiness criteria certification in accordance with the ISO tariff.	February 2022-March 2022

EXHIBIT B
FEDERAL GOVERNMENT CONTRACT PROVISIONS

This Exhibit B contains federal government contract provisions that are necessary for Bonneville to enter into the Agreement.

1. Covenant Against Contingent Fees

Each of the Parties warrants to each of the other Parties that no person or selling agency has been employed or retained by it to solicit or secure the Agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by any Party for the purpose of securing business. For breach or violation of this warranty by any Party other than Bonneville, Bonneville will have the right to annul the contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

2. Contract Work Hours and Safety Standards

The Agreement, to the extent that it is of a character specified in Section 103 of the Contract Work Hours and Safety Standards Act (Act), 40 U.S.C. § 3701, as amended or supplemented, is subject to the provisions of the Act, 40 U.S.C. §§ 3701-3708, as amended or supplemented, and to regulations promulgated by the Secretary of Labor pursuant to the Act.

3. Equal Opportunity Employment Practices

Section 202 of Executive Order No. 11246, 30 Fed. Reg. 12319 (1965), as amended by Executive Order No. 12086, 43 Fed. Reg. 46501 (1978), as amended or supplemented, which provides, among other things, that the Parties will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, is incorporated herein by reference the same as if the specific language had been written into the contract.

4. Use of Convict Labor

The Parties agree not to employ any person undergoing sentence of imprisonment in performing the Agreement except as provided by 18 U.S.C. § 3622(c), as amended or supplemented, and Executive Order No. 11755, 39 Fed. Reg. 779 (1973), as amended or supplemented.

Transfer Service Loads Basics

Please mark the date after your name once you have looked through this document

Name	Reviewed?
Messemer, Clarisse	4/13/2020
Davis, Reed	4/15/2020
Donato, Vinsunt	5/4/2020
Goodwin, Andrew	
Kirby, Elizabeth	
Lozovoy, Diane	4/27/2020 need to see when comments are incorporated.
McManus, Bart	
Meyers, Andy	6/22/2020
Mezzatesta, Mariano	4/29/2020
Pellicori, Damon	4/22/2020
Rohrbough, Justin	4/29/2020
Simpson, Mark	4/15/2020
Guest SMEs:	
Dean Pace	4/13/2020
Scott Newlon	4/13/2020

Associated Feature:
GM0012-125, "Document how we determine Federal Obligations to serve Customers located in other Balancing Authorities" (set 3/1-3/15)

Purpose/Definition: (*"The purpose of this is…"*)
To document how we forecast and schedule to provide energy service for customers located adjacent Balancing Authorities (Dean: "we have to serve it, so we forecast it")

Transfer Service (Transfer Service) Customer: BPA requirements* customer that reside in a Balancing Authority Area other than BPAT. In other words, it is end-use requirements customers located outside of BPA's BA that has load we are obligated to serve.

See the Utility Customer Map on BPA Portal for boundaries of the Transfer Service customers. Please note: the list of EIM entities is constantly changing but by the time BPA joins the EIM, all customers will be in the EIM.

**Note: "Requirements customers" reference customers that have a contract with BPA; therefore, BPA has an obligation. The Bonneville Project Act of 1937 gave preference to public and cooperative utilities of the Pacific Northwest to purchase the low cost power produced by the Columbia River. It is this legislation that allows public utilities that are not physically located in BPA's control area to purchase power from BPA, creating the obligation. This includes Slice customers (Idaho Falls, Tacoma Power & Water, Seattle City Light (previously), Portions of Clark PUD and portions of Emerald PUD) as well as*

BPA-2020-00784-F 0016

*numerous load following preferences customers and several federal agencies. "requirements" is synonymous with *preference.*

Key systems that process data:

- Agency Metering System (AMS)
- Agency Load Forecast (ALF)
- Integrated Scheduling Accounting and ATF Calculator (ISAAC)

Other relevant downstream systems:

  - Transmission Scheduling Automation System (TSAS)
  - AGC
  - Generic Data Acquisition Control System (GDACS)

Processes:

Overview:

AMS captures Transfer Services (Transfer Service) metered interchange data, sends it to ALF. ALF combines this data with weather and uses regressions (not neural net) to generate Transfer Service forecasts. PTKT (Transfer Scheduling & ATF) and PTFR (Real Time) monitor/adjust the forecasts in ALF. The scheduler will push ALF forecasts to ISAAC (this is completed automatically for real time), which then uses available federal resources to automatically create schedules (eTags) to balance to the Transfer Service load forecast. These tags are pushed to TSAS, TSAS then calculates the net scheduled interchange ("controller total"), and pushes it to AGC for basepoint calculation.

ALF's Transfer Service *forecast* and ISAAC's Transfer Service *schedules* are also pulled by LORA to generate THLA in ATLAS and Total Net Load in HERMES (forecast vs. schedule depends on time horizon—THLA uses schedules from ISAAC (users of THLA don't typically look out past pre-schedule close in ATLAS), HERMES Total Net Load uses ALF Transfer Service forecast prior to preschedule, then tags from ISAAC become best available value in LORA past preschedule horizon). The transfer service schedules/tags are used in TSAS to calculate the Controller Total which is used in LORA as part of the calcluation of THLA. Individual customer forecasts, later replaced by schedules and tags are used from ISAAC to calculate the Transfer Service loads that are one of the loads that comprise the Total Net Load.

AMS:

AMS is managed by the metering group (KSM, led by Jeff Racicot). AMS sends metered Transfer Service interchange data via the Meter Data Management (MDM) system—using MV-90 meters—to ALF hourly, daily, and sometimes in 5 minute intervals (not key to load forecasting).

AMS hourly data comes in xx:03, xx:06, xx:09 minutes after the corresponding hour for 150 meters and daily (daily dump, hourly granularity) between 2-4am for 2000 meters. There is an AMS→ ALF daily dump at 2am, and hourly dump for certain loads that we follow in real time.

BPA-2020-00784-F 0016

ALF then forecasts Transfer Service loads every hour (using the past 1000 days of load data up to the last hour) and updates it with weather every 4-6 hours (as it does with Area Load forecasts), etc.

Scott: "…one hour of bad data is typically insignificant in changing the forecast…usually takes 7 days of bad data to impact the model".

Note: you can either manually mark data as bad or set limits in ALF to automatically mark data as bad (if it's a million for example).

ALF:

ALF takes AMS metered data, correlates it with weather data from PGPW (PGPW uses National Weather Service (NWS) for some regions and on weekends), and uses trends and regressions to forecast Transfer Service load (see feature on ALF forecasting for more information on regression models).

Using ALF, the PTFR and PTKT groups continuously ensure the model is well maintained, and make adjustments as necessary. For example, if a line goes down due to a storm, a "0" value is technically "true data" that shows up in ALF, but we don't want a "0" to impact a future forecast. As such, PTK marks the value as bad to avoid it from impacting future forecasts.

ALF's Transfer Service forecasts are either (depending on the type of load) based on persistence* (running a current value forward, like for a data center) or weather related (like with irrigation, commercial, and residential loads).

ALF forecasts can be manually adjusted by PTKT (for example, in Nevada there is a gold mine customer that has communicated to us their load will change so we will manually change the persistence value to the updated communicated load forecast….and it will continue until ALF picks up on the new values as load actuals). These changes are usually 1-5MW, but depending on the situation, can be up to 50MW.

Other model maintenance is outside the purview of PTKT (KSL provides further support).

Note: sometimes ALF has to forecast for null data. If AMS calls into a meter and it has a null value, ALF fills it with its own forecast ("forecast based on a forecast", but usually ~10 of 500 meters come in null so easily fixable—we have a filling model to automatically replace the data with the best available value)

**Transfer Service uses persistence, but NSL and AL do not*

ISAAC:

ISAAC takes the load forecast from ALF, and automatically adds a *system* loss multiplier (varies depending on neighboring BA) to the load forecast to create a *BPA obligation* (Because this is a schedule to a load in a different BA/Transmission Provider, Power Services is responsible for losses).

BPA-2020-00784-F 0016

Transfer Service contracts have the different loss values used (Note: system loss values are trued up in settlements)

To satisfy the obligation, ISAAC uses an allocation engine to align available generating resources with the load obligations taking into account available transmission to create schedules (eTags). This is typically done automatically—real time— (i.e. BPA federal resources or within-BA slice resources), but done manually—preschedule horizon—(i.e. Trading Floor purchases). Though typically Automatic for real time, for preschedule a scheduler still needs to press a button to run the resource to load allocation in order to generate eTags (automatically in ISAAC) and monitor the results.

So how does ISAAC know which paths to use in their schedules? Each load has a prioritized list of which generator it will use (typically optimized to minimize transmission path distance). In general, the prioritized order of generation resources is as follows:

1) Federal Market Purchases (limits set by PTKT and called "frags" for "fragment of a tag") …this is set in ISAAC before the allocation engine runs (PTKT sends PTF a Transfer Service forecast, PTF makes market purchases in preschedule, and sends back to PTKT to put into ISAAC).*note: this reduces TNL, but market purchases don't reduce the load/obligation. the obligation was satisfied by a market purchase rather than from the FCRPS.*
2) Local Federal resources in *other* control areas—like Anderson Ranch, Black Canyon, Palisades, Minidoka ID, & Boise Diversion. Forecast of generation is directly entered into ISAAC by US Bureau of Reclamation (since PacifiCorp entered the EIM). BOR supplies a generation forecast for these facilities based on the planned operations. (BPA does not model the hydrology of the facility operations. BPA Federal Resources allocation engine assumes that the FCRPS generation is unlimited for these purposes at this point in time…ignores reservoir constraints, elevations, etc.)
3) Power transmitted to the transfer area from the FCRPS and must find available transmission.

<u>TSAS and AGC:</u>

From ISAAC, the eTag feeds into TSAS which then determines *Total Net Interchange* (called "Controller Totals, basically net scheduled interchange), and feeds that into AGC for Basepoint calculation (AGC doesn't use specific transfer service eTags and customers).

<u>LORA, ATLAS, and HERMES:</u>

Note: The forecasts from ALF and the eTags from ISAAC are also sent (hourly and daily) to LORA which then uses them to calculate Total Net Load (TNL) in LORA for HERMES (which is how PGSP tracks Transfer Service forecasts…i.e. the 8am daily meetings), and to TSAS to bundle them into the Controller total term sent to LORA to calculate THLA in ATLAS (similarly to how AGC calculates basepoints).

See the feature GM0012-11—*Document what LORA does with ALF forecasts ('creation'/'calculation' of THLA and HERMES* for more information.

BPA-2020-00784-F 0016

Settlements:

Note: If BPA does not meet the obligation with a neighboring BA, that BA will meet it (The Control area has the final responsibility to maintain system reliability). If the load is not covered there will be a settlement. Every time a schedule doesn't match the actual load, a credit or charge is issued to BPA. At the end of the month, the net credit/charge are settled financially between BPA (T?) and the neighboring BA according to the then-current transfer agreement.

BPA-2020-00784-F 0016

Timelines:

There is a AMS→ ALF daily dump at 2am, and hourly dump for certain loads that we follow in real time. ALF then forecasts Transfer Service loads every hour (using the past 1000 days of data) and updates it with weather every 4-6 hours, etc.

PTKT focuses on forecasts and schedules within the preschedule horizon—typically 1-2 days' out

The Power Schedulers in the DSC (real time) are focused on hourly Transfer Service schedules. There is an automatic hourly publish forecast of the ALF forecast into ISAAC, and the allocation automatically runs in real time. So for a new ALF hourly dump, ISAAC will determine if there needs to be a change to eTags and update them automatically if so. If there is a problem with the hourly forecast—say if the ALF published forecast is unusually high or low from the previous published forecast (+/- 50MW), ISAAC will ping that data and ring an alarm to Power Duty Schedulers and they can investigate the source of the bad data (go into ALF, etc.).

TS:

AMS→ALF 2-4am (Daily)

AMS→ALF xx:03, xx:06, xx:09 (Hourly)

Temps→ALF every 4-6 hours

ALF→ISAAC xx:28 (was xx:15)

ISAAC→TSAS *Instantaneously* (& before T-20)

TSAS→AGC *Instantaneously*

AGC→ basepoints xx:50 (interval A)

TSAS→LORA *Instantaneously*

ISAAC→LORA *By T-20 (see side notes*)*

LORA→HERMES 3 times/hr

LORA→ATLAS every 30sec – 1 min

BPA-2020-00784-F 0016

Side Notes

- **Timeline Side Note:* For preschedule: Only updates in LORA once 95% of the tags for the day for the preschedule window come in (and must come in prior to 20 minutes before the hour. Within day it happens instantaneously

- Neighboring BAs: Avista, PAC-East, PAC-West, Puget Sound Energy, Nevada Energy, Northwestern Energy, Portland General Electric, Tacoma PUD, Idaho Power. (there are 9 of these, and each one has full requirements customers)
    - These 9 BAs are the ones that the Transfer Service desks schedule, but there are 3 others (Grant, Douglas, and Chelan) that are scheduled by the customer—not BPA—through PTKP (preschedule group).

- Besides the customers in the 9 BAs above, there are some direct connect Load Following customers (Customers in the BPAT BA) that tag (they tag—not us) non-federal power purchase to their loads.
    - LORA subtracts this load out to calculate NSL

- A number of Transfer Service loads are in EIM BAs. So we need to have tags in by the timelines set by the EIM. Which is currently T-57
- BPA has firm transmission large enough to supply the load from BPAP resources except for PACE which we have enough transmission and resources to meet the average peak load but need to obtain more resources during extreme peak loads when forecasted. This rarely happens.
- During transmission outages we reserve non-firm transmission on any transmission path we can get to serve the load.
- We did have a goal that as a tag got cut, controller totals went down (FCRPS can't serve that load from within the BA anymore) , and THLA (in LORA and ATLAS) would reflect that change. They should both see a reduction in federal obligation when the tag is cut. There hasn't been any validation of the calculation so far, but the Transfer Service team has plans to soon.

Operator Input and Circle back topics:

- **Issues:** *(Please describe issues encountered.)*
    - PTKT will typically round up to the nearest MWH due to imbalance charges. 6 of the Balancing areas with BPA load are in EIM. By rounding up we are attempting to avoid the unknown EIM imbalance energy charge which could be as high as $1000 a MWH.
        - The settlement to generation is based on the Uninstructed Imbalance Energy (UIE) price for the generator RTD LMP to EIM BAAs from CAISO
        - The settlement to load is based on the UIE price (called the EIM Load Aggregation Price "ELAP") to EIM BAAs from CAISO
            - ELAP is the load weighted average price of the 15 minute and 5 minute load node LMPs
    - The xx:28 instead of xx:15 ALF feed could be an issue (have Scott/Dean talk to Reed to confirm)

BPA-2020-00784-F 0016

- Though typically Automatic for real time, for preschedule a scheduler still needs to press a button to run the resource to load allocation in order to generate eTags (automatically in ISAAC) and monitor the results.
    - These changes could result in some adjustments (within the scheduling) hour to Hydro's load obligation. Perhaps consider a threshold at which to notify PGSD of these Transfer Service tag changes (if it is not already in ATLAS-confirm this)
    - These tags are pushed to TSAS, TSAS then calculates the net scheduled interchange ("controller total"), and pushes it to AGC for basepoint calculation.
- We did have a goal that as a tag got cut, controller totals went down (FCRPS can't serve that load from within the BA anymore) , and THLA (in LORA and ATLAS) would reflect that change. They should both see a reduction in federal obligation when the tag is cut. There hasn't been any validation of the calculation so far, but the Transfer Service team has plans to soon.
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- **Potential areas to look for when in EIM:**
    - "EIM doesn't bother transfer, because most the neighboring BAs (6/9) are already in EIM. The only thing it impacts is really just the settlement". There are EIM settlements, there are EI settlements, there are deviation settlements, the WSBP (market settlements) … "we've been in EIM for 5 years".
    - "the only thing we might change would be the generation/where it comes from".
    - At T-75, do we know how much of our loads will be set by the FCRPS?
        - If curtailments persist past the next scheduling hour, we modify the tag in preschedule and try to serve the load through a different transmission path (otherwise it is served by the EIM which could be very costly). So if the curtailment happens AND the tag changes AND we don't do anything—what happens in THLA? The tag change would change the net scheduled interchange which would impact THLA/Basepoints.

Terms:

- eTags (electronic schedules set in ISAAC)

BPA-2020-00784-F 0016

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BPA talking points

BPA makes the business case for signing an implementation agreement as the next step to joining an energy imbalance market

June 2019

What this is

In July 2018, BPA began actively exploring becoming a member of the Western Energy Imbalance Market as part of its broader strategic plan to strengthen financial health and maintain a competitive edge in the utility landscape. BPA launched a stakeholder process at that time to determine how and under what conditions BPA could join the Western EIM operated by the California Independent System Operator.

BPA is issuing a Letter to the Region in June 2019 that will capture the business case for signing an implementation agreement with CAISO. The implementation agreement obligates BPA to spend funds specific to EIM participation. The letter also summarizes principles, proposes decisions on some specific issues and discusses the legal authority that are foundational to making this decision. BPA will open a 30-day public comment period on the letter. A Record of Decision will follow in September 2019.

The implementation agreement is the first of many decisions needed prior to BPA potentially joining the EIM. If the agreement is signed, then BPA will begin to spend money on EIM-specific projects identified in the Grid Modernization Roadmap as well as begin developing a detailed project plan with the CAISO to ensure the necessary systems, processes and training are in place prior to a proposed "go-live" date of March 1, 2022.

For more information, contact: Agnes Lut, 503-230-5651

Key messages

- The work by BPA to establish the processes and technology necessary for participation in the Western Energy Imbalance Market will give regional customers easier access to emerging markets. It could also reduce long-term transmission costs by potentially decreasing or delaying the need for system expansion.
- Selling surplus energy and capacity in the western markets is essential to keeping Bonneville's rates low.
- BPA must adapt its business model as energy markets evolve in order to remain competitive and continue to be a driver of economic prosperity for the Northwest.
- An independent, third-party cost-benefit analysis of BPA's potential participation in the Western EIM forecasts significant qualitative and quantitative benefit to BPA.
- While this is a significant step toward becoming a member of the Western EIM, several decision points and off-ramps exist if BPA determines participation in the EIM is detrimental to the agency, its customers or the Northwest.

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Background

As BPA focuses on long-term financial health and continues its role as an economic engine in the Northwest, the utility landscape is evolving with new realities emerging. Variable energy resources are increasing across the West, creating opportunities to capture valuable flexibility and capacity services that clean hydropower can provide. Additionally, market developments are driving significant changes in transmission use for both customers and system operators. New visibility and congestion management tools are needed to help plan and operate the grid optimally.

These new tools and capabilities will help to more fully realize the value of the sub-hourly dispatch, flexibility and carbon-free hydro attributes of the Federal Columbia River Power System across an expanding energy imbalance market footprint. Much of the market drivers and technology behind the EIM are foundational to fast-evolving market opportunities like day ahead market enhancements.

In BPA's exploration of how and under what conditions it might join the Western EIM, BPA has identified the following 8 issues that need to be resolved or addressed:

- relationship of EIM to other emerging markets;
- balancing authority resource sufficiency;
- EIM settlements;
- market power;
- treatment of transmission;
- generation participation model for the FCRPS;
- governance; and
- carbon obligations in the EIM.

Since BPA began exploring the EIM, several of our bi-lateral trading partners have joined or begun the process of joining the market.

A third-party cost-benefit analysis of EIM participation by BPA suggests that dispatch benefits from the EIM participation would quickly pay for itself and result in ongoing net benefits range of $29-34 million[1]. Additionally, analysis has determined that EIM participation is a cost-effective tool for intra-hour congestion management that may defer the need for costly transmission builds.

EIM participation will result in efficient dispatch of generation to meet load across the entire EIM footprint, while providing BPA with increased visibility and discipline in the dispatch and marketing of federal power and transmission assets. This increased visibility of conditions across the grid will enhance reliability. As a member of the EIM, BPA would be able to effectively participate in the development of future markets that may appropriately compensate flexible resources for the services they provide.

[1] The $29-33.5M annual net benefit is based on stakeholder feedback which led us to consider alternate prices in the NW (PACW, PSEI, & PGE) in an attempt to more accurately simulate BPA's participation, where the previous $43M annual net benefit analysis used DGAP_BPAT prices.

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The Western EIM is a voluntary market where each entity can choose whether or not to bid in resources. BPA can also voluntarily exit the market if market rules change and result in a negative impact to BPA.

Through its monthly EIM stakeholder meetings, BPA has received feedback on the public process moving forward. To that end, BPA is adding an additional opportunity beyond the implementation agreement for public comment with a close out letter in October 2021. This letter would represent the final and binding decision to join the EIM, with a proposed "go-live" date of March 1, 2022.

Questions and answers

GENERAL EIM

1. **What is the EIM? Where can I learn more?**

   An energy imbalance market is a voluntary market that provides a sub-hourly economic dispatch of participating resources for balancing supply and demand every 5 minutes. This market is security-constrained, meaning transmission and reliability constraints would be honored. The Western Energy Imbalance Market (EIM) is operated by the California Independent System Operator (CAISO). It is important to note that the Western EIM is not a regional transmission operator. BPA would preserve its autonomy and retain authority over transmission planning, day-ahead marketing, and transmission system and balancing authority operations if it were to join the EIM. For more information please see: BPA's Grid Mod internal website and CAISO's www.westerneim.com

2. **Does the EIM value both energy and capacity?**

   No, the EIM is an energy only market. The EIM compensates resources for the real-time energy and ramping capability they provide, which BPA views as just one piece of a well-designed electricity market. A well-designed electricity market is built on a strong foundation of resource adequacy, has features that optimize intra-hour energy balancing, and explicitly compensates capacity resources for providing capabilities that are essential for system reliability. Additional mechanisms are required to compensate Bonneville for the flexible capability, carbon-free federal power it chooses to provide. For example, the federal system can ramp up or down quickly to make up for unscheduled changes in solar and wind generation, but there is a cost assocated with holding capacity aside to provide this real-time balance of power supply.

   BPA will continue to work with CAISO and stakeholders to enhance regional resource adequacy by ensuring that flexible resources are appropriately compensated for the services that they provide.

3. **Are there market functions being considered that will provide capacity compensation ?**

   Yes, and Bonneville has taken an active role in the CAISO's ongoing effort to develop a day-ahead flexible ramping product. Specially, the Flexible Ramping Product as part of the Day-Ahead Market Enhancements (DAME) which would be used to manage uncertainty that occurs between the CAISO's day-ahead and fifteen-minute markets. Further, the Implementation Agreement articulates an expectation that the CAISO will consider implementing a bid range transfer system that would allow for bilateral arrangements that value the hydro system's flexibility.

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PROCESS

4. What are the principles guiding BPA's decision-making process relative to the question of joining the Western EIM?

BPA will be guided by four key principles throughout its process to making a final determination with a close out letter in October 2021 on whether to join the Western EIM:

- Consistency with statutory, regulatory and contractual obligations
- Maintain reliability of system
- Voluntary participation
- Sound business rational

5. What is the scope of the summer decision on the implementation agreement? What does it represent as a commitment to join the EIM?

If BPA signs the EIM implementation agreement, it would obligate BPA to begin spending on EIM implementation projects with the CAISO and signal BPA's intent to join the EIM as long as BPA's EIM principles continue to be met. However, it does not bind BPA to join the EIM. The CAISO system integration costs are roughly $1.9 million across 6 equal payments for CAISO to develop the systems and processes necessary for BPA to participate in the market. BPA would also begin on the EIM projects on the Grid Mod Roadmap.

6. Will there be another public process before decides to BPA goes live in 2022?

A second 30-day public comment process will be held in late 2021 in the form of a Close Out Letter that will allow for customers and stakeholders to comment on whether the entirety of the EIM-related decisions meet BPA's EIM principles. In addition, there will be additional public process associated with additional policy decisions discussed in the letter, and there will be specific rate and term and conditions associated with EIM participation tha twill be part of the BP-22 na d TC-22 processes.

7. What, if any, role is there for FERC for the agreement?

CAISO will submit the implementation agreement to FERC for review and approval – this is a standard CAISO process. BPA may submit comments in support of CAISO's filing.

8. What is an EIM implementation agreement? What issues will be resolved in the signing of an implementation agreement?

This agreement outlines the terms of our partnership to prepare for BPA's participation in the Western Energy Imbalance Market. The agreement also outlines scheduled milestones and associated payments to the CAISO for costs of related system changes, software licenses and other configuration activities.

Also, in Recital 14 of BPA's draft EIM Implementation Agreement, BPA has identified 8 EIM Implementation Principles and Participation Principles. These are:

1. A statement that BPA's statutory, regulatory, and contractual requirements will not be violated with BPA's participation;
2. A statement verifying the voluntary nature of market participation;

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3. Affirmation that Reliablity and Operation of the Federal Power and Transmission systems will be maintained;
4. Federal generation participation will be accomplished through the use of 3 aggregations;
5. A request to CAISO for automation support;
6. An acknowledgement of BPA's greenhouse gas attributes as an Asset Controlling Supplier;
7. A request prior to implementation for CAISO to consider base schedule submission timeframe changes; and,
8. A request prior to implementation for CAISO to consider several EIM enhancements.

9. What is BPA's decision process between now and EIM go-live? Where will specific issues be resolved?

Stakeholder engagement will continue until EIM go-live. Specific issues will continue to be addressed by the EIM core team and AE's as we currently do today. After BPA signs the implementation agreement, BPA will initiate a policy implementation decisions phase in which we will address issues and alternatives and seek customer and stakeholder feedback in pre-rate case workshops and pre-terms and conditions case workshops in preparation for the necessary BP-22 Rate Case and TC-22 Tariff Case.

10. What are the additional decision points or off-ramps that exist for BPA after it signs the implementation agreement with the Western EIM? Are there any potential 'deal-breakers' that may impact eventual participation?

At this point BPA has not identified any "deal breakers" that would prevent BPA from joining the EIM. However, BPA will continue to monitor the CAISO's public initiative process and advocate accordingly to protect the value of the federal hydro system and transmission system. Additionally, BPA expects that the CAISO will complete the Day-Ahead Market Enhancements (DAME) policy initiative and implement the Flexible Ramping Product before BPA goes live in the EIM.

11. How will BPA deliver the value of joining an EIM to customers?

If BPA signs the EIM implementation agreement this summer, BPA's participation would give power and transmission customers the opportunity to participate in the market with their own generation. Owners of independent power plants located in the BPA's balancing authority area would also be eligible to participate in the market. The EIM through price signals and market dispatches could incent effective resources to be dispatched (incremental or decremental) to manage the congestion in the most cost effective manner possible while simultaneously ensuring each EIM participating balancing authority area remains balanced. Since any effective and economic EIM Participating Resources can potentially fulfill the market dispatches, the EIM has the potential of reducing the burden on BPA transmission customers and reduce the likelihood of curtailments or scheduling restrictions.

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GRID MOD

12. What does it mean for any new BPA expenditures for the grid modernization initiative? Will customers have an opportunity to have detail and provide input on those initiatives and their costs?

The IPR and QBR for Grid Modernization included expense funding for the EIM projects on the Grid Modernization Roadmap if BPA signs the implementation agreement this summer. Customers can get additional information on Grid Modernization expenditures and project updates from the QBR or Bonneville's external Grid Modernization website.

COST BENEFIT ANALYSIS

13. Are these costs going into the current rate case?

The expense costs associated with EIM are part of the IPR for Grid Modernization which includes starting up several projects related to joining the EIM. Costs associated with joining the EIM and Grid Modernization beyond the current rate period will be part of the 2022 Rate Case.

14. Does BPA believe there is enough value from joining the EIM given the results of the preliminary costs and benefits analysis?

Yes, both the quantitative benefits to BPA of $29-34M annual net benefit and the qualitative benefits that will allow for greater visibility and congestion management of the grid, provide significant value to BPA and form the foundation of the business value that EIM can bring to BPA.

15. Has BPA done an analysis of the costs and benefits of the EIM to date based on actual operations?

Yes, BPA utilized the operational years 2016, 2017 and 2018 to determine the cost benefit analysis of $29-34M annual net benefit. The analysis projected bidding in only the available spin capacity at the Big-10 projects[2].

16. Are there additional benefits of joining the EIM such as opening doors for BPA to participate other emerging market discussions?

Yes, there are potential opportunities for emerging market participation if BPA decides to join the EIM. The CAISO initiative process is looking at possible enhancements and expansion of its markets such as the Expansion of the Day-Ahead Market to EIM (EDAM). EDAM is expected to expand the enhanced day-ahead market to some or all EIM entity balancing authority areas. EDAM is currently in the pre-CAISO policy initiative conceptual phase with an anticipated kick-off of the CAISO policy initiative expected for late summer. BPA is currently not involved in any discussions regarding EDAM with the CAISO or other EIM entities.

[2] Big 10 projects include: Grand Coulee, Chief Joseph, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville dams.

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17. What are the major assumptions in the current cost and benefits analysis?

The current cost benefit analysis is conservative and assumed the following based on the operational years 2016-2018:

	E3 Study
Time frame	• 2016-2018
Flexibility	• Varies over all hours • Historical spinning capability remaining after BA Regulation Requirement is met.
Prices	• Alternative NW price nodes (PSEI, PACW, PGE)

Dispatch Granularity	• Four stage
	  ○ Daily diurnal
	  ○ Hourly
	  ○ 15-min
	  ○ 5-min

Benefits Sources	• Within-day shaping of energy • Volatility of 5-min prices • Price differentials across daily diurnal, hourly, 15-min, and 5-min markets
Success Rate	• 75% - 90%
Volatility Assumption	• Volatility of 15-min prices and 5-min prices reduced by 50% from their hourly averages
Transmission Availability/Cost	• Verified EIM sales were within transmission portfolio expectations
Transmission Benefits	• Qualitative and Illustrative

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18. Will BPA or its customers receive any benefit or reduced costs in terms of the preparation needed for participation in the EIM by virtue of the decision to take reliability coordinator (RC) services from CAISO?

The CAISO fee of about $1.9M to join the EIM is based on a specified formula identified in CAISO's tariff which is calculated using each balancing authority areas load and there is no savings related to CAISO providing RC services. However, there is some integration work that will be accomplished as part of the RC integration that will not have to be done for EIM participation.

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POWER & RESOURCE ADEQUACY

19. How does joining the EIM impact the real-time market?

Joining the EIM may have little impact on the real-time market. BPA currently participates in CAISO's day-ahead and hour ahead markets as well as bilateral trading with counterparties throughout the region. Joining the EIM will provide BPA with another opportunity to market its clean flexible hydro resources.

20. What is the collaboration plan and coordination structure planned for federal partners to stay organized as BPA enters the EIM?

Coordination and communication during the EIM implementation phase will be critical if BPA signs the EIM implementation agreement with the CAISO this summer. BPA will lead this effort, and the "Three Agency Coordination Plan" will continue to be used to facilitate this work. BPA will continue to have weekly Monday check-ins with USBR and USACE, and continue with the monthly technical 3-Agency EIM meetings.

One of the additional EIM-related work streams is improving the coordination between BPA and the hydro projects on how generator units should be loaded for 1-3 future hours. This information will inform the operations for each of the Big-10 projects that would participate in the market.

21. Will FCRPS Biological Opinion spill be impacted by EIM participation?

No. BPA's power marketing services and activities and power demand changes would be conducted consistent with the 2019 NOAA Fisheries CRS Biological Opinion and would be within existing operating constraints and normal operating limits of FCRPS projects.

22. How does BPA plan on changing generation dispatch to USACE and USBR Operating Projects for EIM participation?

The short answer is that BPA intends to change the generation dispatch to realize the value of the flexibility that is available. BPA will likely start with only bidding surplus spinning capability into the EIM, and, after BPA and the project operators gain experience, consider bidding additional non-spinning flexibility at a later time. Also, it is expected that there would be no changes to GDACS with EIM Participation.

23. What is the Pacific Northwest electricity industry doing to ensure resource adequacy is preserved given this focus on electricity markets?

BPA will continue to engage with Pacific Northwest utilities through the NW Power Pool on regional resource adequacy initiatives.

TRANSMISSION

24. Does the Interchange Rights Holder methodology assume transmission is free?

No. Transmission rights are paid for through the purchase of BPA point to point transmission.This methodology specifies that purchased point to point transmission may be donated by BPA power services and other transmission rights holders for use in EIM dispatches rather than for another purpose.

DRAFT

CARBON

25. How will BPA meet California Air Resources Boards (CARBs) EIM carbon compliance requirements?

BPA's policy proposal on carbon in the EIM is to opt out of selling directly into California via the EIM unless Congress provides statutory expenditure authorization for BPA to directly purchase allowances under California and other state carbon programs. BPA does not believe this precludes its participation in the EIM.

- Energy generated in or imported into California is subject to California's greenhouse gas (GHG) regulations.
- If BPA were to participate in the EIM, any carbon attributed to imports into California would incur a compliance obligation
- BPA currently cannot purchase carbon allowances
  - Carbon allowances are considered a state tax by the U.S. DOE, BPA, and other federal agencies.
  - Federal agencies have sovereign immunity from state taxes and cannot pay them without specific Congressional authorization.
  - Absent Congressional authorization to purchase allowances, BPA would not be able to directly deliver EIM energy into California.
  - Analysis suggests that this would decrease the annual net benefit by $4.4M.

26. What if OR and WA adopt carbon legislation similar to CARBs?

If it is determined that purchasing allowances in OR or WA is a state tax (and not a fee), BPA would be precluded from directly delivering EIM energy into these states as well. This would increase the devaluation of the EIM participation. BPA is closely watching both of these efforts.

GOVERNANCE

27. What is BPA's assessment of CAISO EIM Governance?

BPA has determined that the current EIM governance structure does not contain any "showstoppers" to joining the EIM. However, BPA would like to see some improvements to the current governance structure, including:

a. Expand the EIM Governing Body's primary authority;

b. Improve the durability of the current EIM governance structure;

c. Allow for ability to adapt to expanded market functions; and

d. A broader role for public power in the EIM governance structure.

BPA is supporting these improvements in a current stakeholder process that the CAISO has initiated.

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28. In its consideration of EIM participation, is BPA considering the current CAISO EIM Governance model or is BPA assuming some changes as fundamental to its decision of whether to join?

BPA is considering participating in the EIM as it is currently governed by the independent EIM Governing Body and the Board of Governors of the California ISO. However, BPA supports the recent initiation of a review of EIM governance.

BPA believes the review of EIM governance is well timed given the EIM's expansion in both geography and in membership, particularly with the addition of public power members and, potentially, at least one federal power marketing administration. With future market evolution discussions taking shape, Bonneville believes it is important that the ISO demonstrate that regional market expansion is transparently and fairly administered.

BPA views the improved durability and independence of the EIM governance structure as fundamental to the stability and expansion of the market. Strengthening the durability of the EIM Governing Body will help to allay regional concerns that the EIM will be directed primarily by California-centric interests.

29. What steps could CAISO take that might allay BPA's concerns regarding governance?

BPA favors the expansion of the EIM Governing Body's primary authority to encompass any market rule change that is driven primarily by factors specific to the EIM balancing authorities. BPA believes that the EIM Governing Body's primary authority should extend to all generally applicable real-time market rules regardless of the driver for the change, except for those changes that have no material effect on the EIM or EIM Balancing Authority Areas.

BPA recommends expanding the role of the EIM Governing Body, with advisory input from stakeholders, to develop and recommend items for the ISO's annual Policy Initiatives Roadmap that would fall within its primary authority.

30. What is the CAISO's process for looking at changes to Governance going forward?

The current EIM charter calls for initiating a review of EIM governance by 2020. The CAISO and EIM Governing Body began that review in December 2018. They are currently considering public comments on the proposed review process.

The CAISO proposes to develop a stakeholder committee whose role would be facilitating the ongoing EIM governance review. This "EIM Governance Review Committee" would develop through an iterative public stakeholder process a set of proposed revisions to the current EIM governance structure in light of experience to date and changes to the EIM since its inception. The Committee would accomplish this by developing a series of issue papers and straw proposals for public stakeholder comment, culminating in a draft final proposal for consideration by the EIM Governing Body and the CAISO Board of Governors. The CAISO expects the review to take 8 to 12 months once the GRC is formed.

RATES (CUSTOMER IMPACTS OF EIM)

31. What would BPA's joining the EIM mean for me as a Load Following customer? Block? IPP? Slice/Block?

If BPA signs the EIM Implementation agreement this summer, these questions will be explored through internal teams and external customer and stakeholder engagement in pre-rate case workshops and pre-terms and conditions case workshops. The decisions on how to

DRAFT

implement those policies will be made during the post-ROD policy process, the Rate Case, and Terms and Conditions tariff process.

32. Does joining the EIM change BPA's relationship with its preference customers?

No, if BPA joins the EIM this would not change the statutory protections and relationship our preference customers are entitled to.

TARIFF

33. BPA undertook a huge effort in 2018 to be able to update its Open Access Transmission Tariff. What changes to the tariff need to take place during the TC-22 case to enable participation in an EIM?

When a balancing authority joins the EIM, it must adopt applicable tariff language. BPA will adopt these necessary changes through the TC-22 proceeding after exploring options with customers and stakeholders in the pre-terms and conditions workshops. Beyond participation in the EIM, many commercial changes are fundamental to the grid modernization effort and will be reflected in our tariff and business practices. .

IMPLEMENTATION

34. How will the EIM impact BPA staffing levels?

BPA does not currently plan to change its overall staffing levels. There may be some areas of BPA that see an increase in staffing, but it will be offset by reductions elsewhere.

35. What work do BPA and its customers need to do between signing the EIM implementation agreement and the proposed go-live date of March 1, 2022?

The needed work to be completed by customers will be identified in the next phase of the EIM process if BPA signs the EIM implementation agreement. If BPA signs the agreement this summer, BPA would begin work on the EIM projects identified on the Grid Modernization Roadmap and begin developing a detailed project management plan with the CAISO to identify the milestones and dates for each of the deliverables in order to go live on March 1, 2022.

36. How will BPA get all this work done?

In order to accommodate the additional work and complexity of BPA's business, BPA added an extra year to the typical implementation timeline to join the EIM. BPA may also have to prioritize its workload, which may mean reducing or stopping certain work in order to accomplish EIM work.

37. What are the next steps?

Next steps include Policy Implementation decisions phase which will roll into the pre-rate case workshops and pre-terms and conditions workshops in preparation for the necessary BP-22 Rate Case and TC-22 Tariff Case. This work would start immediately if BPA signs the EIM implementation agreement.

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