2.2 The term "digital subscriber line" ("xDSL") describes various technologies and services. The "x" in xDSL is a place holder for the various types of DSL services, such as, but not limited to ADSL (asymmetric digital subscriber line), HDSL (high-speed digital subscriber line), IDSL (ISDN Digital Subscriber Loop), SDSL (symmetrical digital subscriber line), UDSL (universal digital subscriber line), VDSL (very high-speed digital subscriber line), and RADSL (rate-adaptive digital subscriber line).

2.3 A loop technology that is "presumed acceptable for deployment" is one that either complies with existing industry standards, has been successfully deployed by any carrier in any state without significantly degrading the performance of other services, or has been approved by the Federal Communications Commission ("FCC"), any state commission, or an industry standards body. Loop technologies presumed acceptable for deployment include, but are not limited to those referenced in Appendix A.

2.4 A "non-standard xDSL-based technology" is a loop technology that is not presumed acceptable for deployment under Section 2.3 of this Attachment. Deployment of non-standard xDSL-based technologies are allowed and encouraged by this Agreement.

3.0 General Terms and Conditions Relating to Unbundled xDSL-Capable Loops

3.1 SWBT agrees to provide CLEC with access to UNEs (including xDSL capable loops) to provide advanced services in accordance with the terms of this Attachment and the general terms and conditions applicable to UNEs under this Agreement.

3.2 CLEC's use of any SWBT network element, or of its own equipment or facilities in conjunction with any SWBT network element, will not materially interfere with or impair service over any facilities of SWBT, its affiliated companies or connecting and concurring carriers involved in SWBT services, cause damage to SWBT's plant, impair the privacy of any communications carried over SWBT's facilities or create hazards to employees or the public. Upon reasonable written notice and after a reasonable opportunity to cure, SWBT may discontinue or refuse service if CLEC violates this provision, provided that such termination of service will be limited to CLEC's use of the element(s) causing the violation. SWBT will not disconnect the elements causing the violation if, after receipt of written notice and opportunity to cure, the CLEC demonstrates that their use of the network element is not the cause of the network harm. If SWBT does not believe the CLEC has made the sufficient showing of harm, or if CLEC contests the basis for the disconnection, either Party must first submit the matter to dispute resolution under Section 3.3 of this Attachment. Any claims of network harm by SWBT must be supported with specific and verifiable supporting information.

affected by the claim, all other documents or records determined to be discoverable, and all other relevant documents or records that defense counsel may reasonably request in preparation and defense of the Covered Claim. Indemnitee will further cooperate with Indemnifying Party's investigation and defense of the Covered Claim by responding to reasonable requests to make its employees with knowledge relevant to the Covered Claim available as witnesses for preparation and participation in discovery and trial during regular weekday business hours. Indemnitee will promptly notify Indemnifying Party of any settlement communications, offers or proposals received from claimants.

3.5.4 Indemnitee agrees that Indemnifying Party will have no indemnity obligation, and Indemnitee will reimburse Indemnifying Party's defense costs, in any case in which Indemnifying Party's technology is determined not to be the cause of any Indemnitee liability.

3.6 Claims Not Covered: No Party hereunder agrees to indemnify or defend any other Party against claims based on gross negligence or intentional misconduct.

3.7 Attachment 26 addresses the sections of the Texas 271 Agreement that are "legitimately related" for the purpose of Section 252(i) of the Federal Telecommunications Act of 1996. This Agreement is expressly limited to the item(s) or section(s) into which CLEC MFNs under Section 252(i), as described in Attachment 26.

4.0 Unbundled xDSL-Capable Loop Offerings

4.1 SWBT will provide a loop capable of supporting a technology presumed acceptable for deployment or non-standard xDSL technology as described in this Attachment.

4.2 SWBT shall not deny a CLEC's request to deploy any loop technology that is presumed acceptable for deployment, or one that is addressed in Section 4.3 of this Attachment, unless it has demonstrated to the Commission that the CLEC's deployment of the specific loop technology will significantly degrade the performance of other advanced services or traditional voice band services. For the purpose of this section, "significantly degrade" means to noticeably impair a service from a user's perspective.

4.2.1 In the event the CLEC wishes to introduce a technology that has been approved by another state commission or the FCC, or successfully deployed elsewhere, the CLEC will provide documentation describing that action to SWBT and the Commission before or at the time of their request to deploy that technology in Texas. The documentation should include the date of approval or deployment, any limitations included in its deployment, and a sworn attestation that the deployment did not significantly degrade the performance of other services. The

terms of this paragraph do not apply during the twelve-month period described in Section 4.3.

4.2.2 If a CLEC request to deploy a loop technology is denied under this Section 4.2, SWBT will disclose to the requesting CLEC complete information with respect to the denial, including the specific reason for the denial, within 48 hours of the denial.

4.3 For the 12-month period following the approval of this Agreement by the Commission, a CLEC may order loops other than those loop technologies presumed acceptable for deployment for the provision of service in Texas on a trial basis, without the need to make any showing to the Commission. Each technology trial will not be deemed successful until it has been deployed without significant degradation for 12 months or until national standards have been established, whichever occurs first.

4.3.1 CLEC's deployment of non-standard xDSL technologies as described in Section 2.4 under Section 4.3 of this Attachment during the interim period by itself shall not be deemed a successful deployment of the technology under the FCC's Order issued on March 31, 1999 in CC Docket No. 98-147, FCC 99-48.

4.3.2 If a loop technology is deployed without significant degradation for 12 months, or if national standards for the technology are established, whichever occurs first, the parties should consider the technology to be presumed acceptable for deployment and treated in accordance with Section 2.3 of this Attachment. If there is dispute as to the successful deployment of the technology, either Party may submit the dispute for resolution according to Section 3.3 of this Attachment.

4.4 Following expiration of the twelve month period referenced in Section 4.3 above, SWBT will not deny a requesting CLEC's right to deploy new xDSL technologies that do not conform to the national standards and have not yet been approved by a standards body (or otherwise authorized by the FCC, any state commission or which have not been successfully deployed by any carrier without significantly degrading the performance of other services) if the requesting CLEC can demonstrate to the Commission that the loop technology will not significantly degrade the performance of other advanced services or traditional voice band services.

4.4.1 Upon request by CLEC, SWBT will cooperate in the testing and deployment of new xDSL technologies or may direct the CLEC, at CLEC's expense, to a third party laboratory of CLEC's choice for such evaluation.

4.4.2 If it is demonstrated that the new xDSL technology will not significantly degrade the other advanced services or traditional voice based services, SWBT will provide a loop to support the new technology for CLEC as follows:

4.4.2.1 If the technology requires the use of a 2-Wire or 4-Wire loop that meets the engineering design criteria of a 2-Wire or 4-Wire loop already provisioned by SWBT, then SWBT will provide CLEC a loop capable of supporting the new xDSL technology at the same rates listed for the appropriate 2-Wire and 4-Wire loops and associated loop conditioning as needed. SWBT will supply CLEC with the appropriate ordering procedures within 10 business days of CLEC's request for a loop capable of supporting the new xDSL technology.

4.4.2.2 If a new xDSL technology requires a loop type that differs from the engineering design criteria of a 2-Wire or 4-Wire loop already provisioned by SWBT, the Parties shall expend diligent efforts to arrive at an agreement as to the rates, terms and conditions for an unbundled loop capable of supporting the proposed xDSL technology. If negotiations fail, any dispute between the Parties concerning the rates, terms and conditions for an unbundled loop capable of supporting the proposed xDSL technology shall be resolved pursuant to the dispute resolution process provided for in this Agreement.

4.4.3 SWBT will not deploy any technology covered by Section 4.4 for its own retail operations, for the retail operations of an affiliate, or to provide service to a third party (whether retail or wholesale) until it has made ordering procedures for the related unbundled loop type, and reasonable rates, terms and conditions for such loop type available to CLEC.

4.5 If SWBT or another CLEC claims that a service is significantly degrading the performance of other advanced services or traditional voice band services, then SWBT or that other CLEC must notify the causing carrier and allow that carrier a reasonable opportunity to correct the problem. Any claims of network harm must be supported with specific and verifiable supporting information. In the event that SWBT or a CLEC demonstrates to the Commission that a deployed technology is significantly degrading the performance of other advanced services or traditional voice band services, the carrier deploying the technology shall discontinue deployment of that technology and migrate its customers to technologies that will not significantly degrade the performance of other such services.

4.6 The provision of xDSL service on a loop configured on a Digital Loop Carrier (DLC) system will be treated in the same manner as new xDSL technologies addressed in Section 4.3 of this Attachment, unless the CLEC can demonstrate that such configuration meets the requirements by which it would be presumed acceptable for deployment under Section 2.3.

5.0 OSS

5.1 SWBT will provide CLEC with the same access to the operations support systems ("OSS") and/or functions for pre-ordering, ordering, and provisioning xDSL-

capable loops that SWBT is providing any other CLEC and/or that SWBT is utilizing to provision its own retail xDSL service. This includes any OSS utilized by SWBT's service representatives or other provisioning personnel. Any provisions relating to OSS in an underlying agreement agreed to between CLEC and SWBT shall govern the Parties' respective rights and obligations with respect to OSS. In addition, SWBT will provide comparable nondiscriminatory xDSL order management.

5.2 Upon request, SWBT will provide mechanized access to a loop length indicator via enhancements to Verigate and Datagate for use with xDSL-based or other advanced services in specific SWBT wire centers in which the CLEC has collocated or has ordered collocation and has advised SWBT of its intent to order xDSL-capable loops. The loop length indicator is an indication of the approximate loop length, based on a 26-gauge equivalent and is calculated on the basis of Distribution Area distance from the central office.

5.3 SWBT, upon request by CLEC for those wire centers where CLEC has collocated or has ordered collocation and has advised SWBT of its intent to order xDSL-capable loops, will provide actual loop length (where such information is currently available in any SWBT data base, including back-office systems) at no charge for use with xDSL-based or other advanced services. In such wire centers where actual loop length is not available through a SWBT data base as described above, the CLEC may request actual loop length at the charges shown as "Loop Make-Up Information – Manual" in Section 9.1 of this Attachment.

5.4 To the extent SWBT is technically able to access the following in its retail operations, SWBT will develop and deploy mechanized and integrated OSS that will permit: (1) real-time CLEC access through an electronic gateway to a database that contains the loop makeup information, including theoretical cable length, gauge, presence and number of load coils, presence of repeaters, presence of DLC, and number of disturbers in same and adjacent binder groups; (2) mechanized, flow-through ordering, loop design, and provisioning any xDSL loop type. SWBT, the Commission and competitive local exchange carriers shall jointly pursue, in a timely manner, an industry standard mechanized OSS solution to accessing loop qualification data.

6.0 Service Quality and Maintenance

6.1 SWBT will not guarantee that the local loop(s) ordered will perform as desired by CLEC for xDSL-based or other advanced services, but will guarantee basic metallic loop parameters, including continuity and pair balance. CLEC-requested testing by SWBT beyond these parameters will be billed on a time and materials basis at Access Tariff 73 rates.

6.2 Maintenance, other than assuring loop continuity and balance, on unconditioned or partially conditioned loops in excess of 12,000 feet, will only be provided on a time and material basis as set out elsewhere in this Agreement. On loops where CLEC has requested that no conditioning be performed, SWBT's maintenance will be limited to verifying loop suitability based on POTS design criteria. For loops having had partial or extensive conditioning performed at CLEC's request, SWBT will verify continuity, the completion of all requested conditioning, and will repair at no charge to CLEC any gross defects which would be unacceptable based on current POTS design criteria and which do not result from the loop's modified design.

6.3 Each xDSL-Capable Loop offering provided by SWBT to CLEC will be at least equal in quality and performance as that which SWBT provides to itself or to an affiliate.

7.0 Provisioning

7.1 The provisioning and installation interval for a xDSL-capable loop, where no conditioning is requested, on orders for 1-20 loops per order or per end-user location, will be 5 - 7 business days, or the provisioning and installation interval applicable to SWBT's tariffed xDSL-based services, or its affiliate's, whichever is less. The provisioning and installation intervals for xDSL-capable loops where conditioning is requested, on orders for 1-20 loops per order or per end-user customer location, will be 15 business days, or the provisioning and installation interval applicable to SWBT's tariffed xDSL-based services or its affiliate's xDSL-based services where conditioning is required, whichever is less. Orders for more than 20 loops per order or per end-user location, where no conditioning is requested, will have a provisioning and installation interval of 15 business days, or as agreed upon by the Parties. Orders for more than 20 loops per order which require conditioning will have a provisioning and installation interval agreed by the parties in each instance.

7.1.1 Subsequent to the initial order for a xDSL Capable Loop, additional conditioning may be requested on such loop at the rates set forth below and the applicable service order charges will apply; provided, however, when requests to add or modify conditioning are received within twenty-four (24) hours of the initial order for a xDSL-capable loop, no service order charges shall be assessed, but the due date may be adjusted as necessary as agreed to by the parties. The provisioning interval for additional requests for conditioning pursuant to this subsection will be the same as set forth above.

8.0 Spectrum Management

8.1 The Parties acknowledge that selective feeder separation is a disputed item in the current xDSL Arbitration proceedings, the results of which will replace this

Attachment on a permanent basis. If SWBT uses a selective feeder separation method to manage the spectrum, in all cases, SWBT will manage the spectrum in a competitively neutral manner consistent with all relevant industry standards. In the interim period, SWBT agrees that CLEC's order for an xDSL-capable loop will not be delayed by any lack of availability of a specific binder group or "spectrum exhaust." SWBT shall be under no obligation to provision xDSL-capable Loops in any instance where physical facilities do not exist. If SWBT reconfigures loops into a designated binder group, it shall do so at no cost to CLEC.

8.2 CLEC will advise SWBT of the Power Spectral Density ("PSD") mask approved or proposed by T1.E1 that reflects the service performance parameters of the technology to be used. The CLEC, at its option and without further disclosure to SWBT, may provide any service compliant with that PSD mask so long as it stays within the allowed service performance parameters. The CLEC shall provide the PSD mask within which it plans to provide xDSL service at such time as the xDSL-capable loop is ordered. The CLEC shall advise SWBT if the service is changed such that a different PSD mask would be applicable. The CLEC shall abide by standards pertinent for the designated PSD mask type at all times. The CLEC service representatives will provide such identification on the order form.

8.3 SWBT agrees that as a part of spectrum management, it will maintain an inventory of the existing services provisioned on the cable. SWBT will assign loops so as to minimize interference between and among advanced services, including xDSL-based services, and other services. In all cases, SWBT will manage the spectrum in a competitively neutral manner consistent with all relevant industry standards regardless of whether the service is provided by a CLEC or by SWBT, as well as competitively neutral as between different xDSL services. Where disputes arise, SWBT and CLEC will put forth a good faith effort to resolve such disputes in a timely manner. As a part of the dispute resolution process, SWBT will, upon request from a CLEC, disclose within 3-5 business days information with respect to the number of loops using advanced services technology within the binder group and the type of technology deployed on those loops so that the involved parties may examine the deployment of services within the affected loop plant.

8.4 In the event that a loop technology without national industry standards for spectrum management is deployed, SWBT, CLECs and the Commission shall jointly establish long-term competitively neutral spectral compatibility standards and spectrum management rules and practices so that all carriers know the rules for loop technology deployment. The standards, rules and practices shall be developed to maximize the deployment of new technologies within binder groups while minimizing interference, and shall be forward-looking and able to evolve over time to encourage innovation and deployment of advanced services. These standards are to be used until such time as national industry standards exist.

CLECs that offer xDSL-based service consistent with mutually agreed-upon standards developed by the industry in conjunction with the Commission, or by the Commission in the absence of industry agreement, may order local loops based on agreed-to performance characteristics. SWBT will assign the local loop consistent with the agreed-to spectrum management standards.

8.5 In the event that the FCC or the industry establishes long-term standards and practices and policies relating to spectrum compatibility and spectrum management that differ from those established in this Agreement, SWBT and CLEC agree to comply with the FCC and/or industry standards, practices and policies and will establish a mutually agreeable transition plan and timeframe for achieving and implementing such industry standards, practices and policies.

8.6 Within thirty (30) days after general availability of equipment conforming to industry standards or the mutually agreed upon standards developed by the industry in conjunction with the Commission, if SWBT and/or CLEC is providing xDSL technologies deployed under Section 4.0 above, or other advanced services for which there is no standard, then SWBT and/or CLEC must begin the process of bringing its deployed xDSL technologies and equipment into compliance with such new standards at its own expense.

9.0 Rates for xDSL Capable Loops and Associated Charges, Billing and Payments of Rates and Charges

9.1 SWBT's rate for xDSL-capable loops, and associated charges, shall be as follows:

	Recurring	Nonrecurring Initial	Additional
2-wire Analog xDSL-capable Loop	$14.15	$15.35	$6.22
2-wire Digital xDSL-capable Loop	$38.24	$15.03	$6.22
4-wire Analog xDSL-capable Loop	$19.41	$15.03	$6.22
4-wire Digital xDSL-capable Loop	$76.15	$73.25	$26.68
Loop Make-Up Information - Mechanized		$0.00	
Loop Make-Up Information - Manual		$10.00	
xDSL Cross Connect Charge – Standard:			
2-wire Analog	$1.24	$4.72	$4.72

4-wire Analog	$2.49	$29.56	$29.56
2-wire Digital	$1.24	$4.72	$4.72
4-wire Digital	$6.67	$39.05	$34.16
<u>xDSL Cross Connect Charge – Shielded:</u>			
2-wire Analog	$1.24	$4.72	$4.72
4-wire Analog	$2.49	$29.56	$29.56
2-wire Digital	$1.24	$4.72	$4.72
4-wire Digital	$6.67	$39.05	$34.16

Note: There is no requirement that a CLEC order shielded cross-connects.

DSL Conditioning Options:

Removal of Repeater	$0.00	$0.00	$0.00
Removal of Bridged Tap and Repeater	$0.00	$0.00	$0.00
Removal of Bridged Tap	$0.00	$0.00	$0.00
Removal of Bridged Tap and Load Coil	$0.00	$0.00	$0.00
Removal of Load Coil	$0.00	$0.00	$0.00

9.2 The Parties acknowledge and agree that all of the rates set forth above, are interim and subject to true-up pending the final Order in the xDSL Arbitration. The parties further agree that if the Commission determines that CLEC must pay for the conditioning of xDSL-capable loops and establishes rate(s) for any xDSL Conditioning Options, SWBT shall not seek retroactive true-up from CLEC for any conditioning performed under this Interim Attachment on loops under 15,000 feet.

9.3 SWBT will provide CLEC a monthly bill that includes all charges incurred by and credits and/or adjustments due to CLEC for those unbundled elements and other service offerings ordered, established, utilized, discontinued or performed pursuant to this Attachment.

9.4 Except as otherwise specifically provided elsewhere in this Agreement, the Parties will pay all rates and charges due and owing under this Attachment within thirty (30) days of receipt of an invoice. Except as otherwise specifically provided in this Agreement, interest on overdue invoices will apply at the six (6) month Commercial Paper Rate applicable on the first business day of each calendar year.

10.0 Reconsideration after Pending xDSL Arbitration

10.1 The Parties acknowledge and agree that the terms and conditions set forth in this Attachment shall be subject to the outcome of the xDSL Arbitration, subject to any associated judicial review; provided, however, until such time as a final Order is issued by the Commission in the xDSL Arbitration, the rates, terms and conditions set forth in this Attachment shall apply. Following the issuance of a final Order by the Commission in the xDSL Arbitration, the Parties shall meet within thirty days and expend diligent efforts to arrive at an agreement on conforming modifications to this Attachment, based on the final outcome of the xDSL Arbitration and the Memorandum of Understanding filed by SWBT on April 26, 1999, in Project No. 16251, *Investigation of Southwestern Bell Telephone Company's Entry Into the Texas InterLATA Telecommunications Market.* If negotiations fail, disputes between the Parties concerning the interpretation of the actions required or the provisions affected in this Attachment shall be handled under the Dispute Resolution procedures set forth in this Agreement. Except as otherwise provided, the results of the xDSL Arbitration shall be effective prospectively from the date the Commission's Order becomes final, unless the Order is stayed pending appeal.

10.2 Following the issuance of a final Order in the xDSL Arbitration, a CLEC party to this Attachment will have the option of either continuing to operate under this Attachment as modified according to Section 10.1, or electing to MFN into the xDSL rates, terms, and conditions that result from the xDSL Arbitration.

10.3 Performance measurements for xDSL will be finalized within thirty (30) days after the final Order in the xDSL Arbitration.

Appendix A

xDSL Technologies Presumed Acceptable for Deployment

The technologies listed in this Appendix are presumed acceptable for deployment. This list should be expanded as additional services are deployed, or national standards developed.

The following technologies currently have a national standard in place:

Technology	Standard
ADSL & RADSL	T1E1 LB715 (T1E1.4/99-161)/ANSI T1.413 – 1998 (Issue 2) FDM/ITU 992.1
SDSL 784 kb/s & 1.5 Mb/s	ANSI TR.28/ ITU 991.1
IDSL	ANSI T1.601
HDSL	ANSI TR28/ITU 991.1

The following technologies have been successfully deployed with no apparent degradation of the performance of other services:

SDSL 160 kb/s - 784 kb/s

SDSL 1.0, 1.1 Mb/s

DOCKET NOS. 20226 and 20272

PETITION OF COVAD COMMUNICATIONS COMPANY FOR ARBITRATION OF INTERCONNECTION RATES, TERMS, CONDITIONS AND RELATED ARRANGEMENTS WITH SOUTHWESTERN BELL TELEPHONE COMPANY	)	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

SUPPLEMENTAL DIRECT TESTIMONY OF ANJALI JOSHI ON BEHALF OF COVAD COMMUNICATIONS COMPANY

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DOCKET NO. 20272

PETITION OF COVAD COMMUNICATIONS COMPANY FOR ARBITRATION OF INTERCONNECTION RATES, TERMS, CONDITIONS AND RELATED ARRANGEMENTS WITH SOUTHWESTERN BELL TELEPHONE COMPANY	)	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

SUPPLEMENTAL DIRECT TESTIMONY OF ANJALI JOSHI ON BEHALF OF COVAD COMMUNICATIONS COMPANY

Respectfully submitted,

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May 24, 1999

1 **I. INTRODUCTION**

2 **Q. Please state your name, title, and business address.**

3 A. My name is Anjali Joshi. Covad Communications Company located at 2330 central
4 Expressway, Santa Clara, California 95050 Clara, employs me. I am Covad's Director of
5 Network Engineering, and am responsible for infrastructure planning and implementation.

6 **Q. Please describe your qualifications and experience as they relate to your testimony**
7 **in these proceedings.**

8 A. I have extensive experience designing and building carrier class networks for voice and
9 data. Prior to joining Covad, I was at AT&T, where I developed several services including
10 AT&T's InterSpan ATM service. I have Masters degrees in Engineering Management and
11 Computer Engineering and a Bachelor's degree in Electrical Engineering.

12 **Q. Have you submitted testimony earlier in these proceedings?**

3 A. Yes, I submitted direct and rebuttal testimony.

14

15 **II. PURPOSE OF SUPPLEMENTAL TESTIMONY**

16 **Q. What is the purpose of your supplemental testimony?**

17 A. I explain why SWBT's proposed Spectrum Management Plan lacks a sound engineering
18 basis and how it discriminates in favor of ADSL and against other forms of DSL including
19 SDSL. This supplemental testimony is necessary because recent discovery revealed a great deal
20 of information about SWBT's Plan that SWBT did not disclose before the initial arbitration
21 hearing in April.

22 **Q. Please summarize your testimony.**

23 A. My testimony will:

4 - Describe SWBT's Spectrum Management Plan;

- Explain how SWBT's Spectrum Management Plan, which manages interference in the upstream signal, does not benefit ADSL service, which is limited by downstream interference;
- Explain how SWBT's Spectrum Management Plan favors ADSL service and will limit the deployment and degrade the performance of other DSL technologies offered by Covad, ACI, and other DSL CLECs;
- Explain why SWBT's ADSL Interference Tables (Ex. 17A, Attach. 1 [hereinafter "SWBT ADSL Interference Tables"]), do not justify SWBT's Spectrum Management Plan;[1]
- Explain that SWBT's Spectrum Management Plan cannot be implemented given the actual conditions of the outside loop plant and the limitation of SWBT's data records regarding those conditions;
- Recommend that the Commission reject SWBT's Spectrum Management Plan.

III. SWBT'S SPECTRUM MANAGEMENT PLAN

Q. Based upon the new information disclosed in the recent discovery, please summarize SWBT's proposed Spectrum Management Plan.

A. SWBT's Spectrum Management Plan may be described in two parts. In the first part of the Plan, named "Selective Feeder Separation" or "SFS," SWBT reserved a significant portion of the loop complements in the plant as "ADSL-Only" complements. In the second part of the Plan, SWBT will limit the deployment of other competitive DSL services in loop complements that SWBT assumes are physically adjacent to the ADSL

complements. Both parts of the Plan rely on an interference table purporting to show how the theoretical reach of SWBT's specific ADSL service may be limited by the presence of T1, HDSL, and IDSL services in the same or theoretically "adjacent" binder groups.

IV. SWBT's SPECTRUM MANAGEMENT PLAN IS TECHNICALLY AND OPERATIONALLY UNFOUNDED.

Q. Do you believe that SWBT's Spectrum Management Plan is technically and operationally valid?

A. No. The primary problems with SWBT's Spectrum Management Plan may be summarized as follows:

- **Selective Feeder Separation Does Not Benefit ADSL**—SWBT's Spectrum Management Plan relies on Selective Feed Separation (SFS). Selective feeder separation manages the spectrum in the feeder cable running from the central office (*i.e.*, the F1 or D1). SWBT's Plan does not include any management of the spectrum in the distribution portion of the plant (*i.e.*, the F2 or D2). Because the reach and performance of ADSL services are limited by the interference in the distribution portion of the plant, SWBT's proposal to impose selective feeder separation will not provide any benefit to the reach or performance of its ADSL service.
- **SWBT's Plan Relies on an Interference Table for ADSL Alone**— SBC-TRI, Inc. (an affiliate of SWBT) created the SWBT ADSL Interference Table, purporting to show how the theoretical reach of SWBT's specific ADSL service may be limited by the presence of T1, HDSL, and IDSL services in the same or theoretically "adjacent"

---

[1] A true and correct copy of the SWBT ADSL Interference Table is attached as Ex. 1.

1 binder groups. The Table relies on several assumptions regarding the interference
2 from loops in the same and adjacent binders that do not apply to actual loop plant
3 conditions. Additionally SWBT's tables focus only on SWBT's ADSL service and
4 SWBT's Plan does not rely on analogous tables showing how other DSL services
5 (*e.g*, SDSL, HDSL or IDSL) are affected by the presence of T1, HDSL, IDSL,
6 ADSL, or other DSL services.

7 • **SWBT Attempts to Implement the Restrictions of the SWBT Interference Table**
8 **Without the Necessary Loop Plant Data**—The theoretical information provided by
9 the SWBT Interference Table necessarily assumes the existence of outside plant data
10 regarding the relative position of loops—*i.e.*, whether loops are deployed in the same
11 binder or in an adjacent binder. SWBT's loop plant data, however, consists only of
12 a loop "complement" numbering system (*e.g.*, Complement 1 = Loops 1-100,
13 Complement 2 = Loops 101-200) that does not provide information about the
14 physical location of loops (*i.e.*, whether loops are in the same or in an adjacent
15 binder).

16 • **SWBT Reserved the "Cleanest" Loop Complements for ADSL**—In the first part
17 of SWBT's Spectrum Management Plan, named "Selective Feeder Separation" or
18 "SFS," SWBT reserved a significant portion of the loop complements in the plant as
19 "ADSL-Only" complements. SWBT completed its reservation of ADSL-Only
20 complements by January 31, 1999, before Covad or other CLECs were allowed to
21 deploy any DSL services. SWBT used the ADSL Interference Table to reserve for
22 ADSL as many of the "cleanest" complements "as operationally possible." This
23 practice drastically reduced the amount of loop space for other DSL services and

1 forces CLECs to deploy their services in spectrally "dirtier" complements, resulting
2 in significant performance degradation.

3 • **SWBT Defines Spectrum Exhaust Based On the Preservation of Their Own**
4 **ADSL Service**—In the second part of SWBT's Spectrum Management Plan, SWBT
5 limits deployment of DSL services other than ADSL according to its definition of
6 spectrum exhaust. Under SWBT's definition, "spectrum exhaust" occurs when,
7 according to the ADSL Interference Table, the deployment of a DSL service other
8 than ADSL would reduce the reach of SWBT's ADSL service below the length of
9 longest loop in an ADSL-Only complement. SWBT's Plan does not provide similar
10 protection for the ADSL speeds Covad offers, for Covad's SDSL service, or for any
11 other DSL service offered by a CLEC.

12 **A. Selective Feeder Separation Does Not Benefit ADSL.**

3 **Q. Please describe "Selective Feeder Separation" or "SFS."**

14 A. Selective Feeder Separation (SFS) is the first part of SWBT's Spectrum Management
15 Plan. SWBT has dedicated specific loop complements (not binder groups) in the feeder cable
16 (*i.e.*, the F1 or D1) to ADSL exclusively. SWBT will not permit CLECs to deploy any other
17 forms of DSL in these loop complements. SWBT does not intend to manage the spectrum in the
18 distribution plant (*i.e.*, the F2 or D2).

19 **Q. Why is SWBT seeking to implement SFS?**

20 A. It is difficult to understand SWBT's motivation for implementing SFS. An uninformed
21 reader of SWBT's ADSL Interference Table may be inclined to conclude that if ADSL service
22 were kept separate from all other services in the loop plant, it's reach would be increased
23 substantially. Thus, SWBT apparently seeks to impose the Plan for two reasons, both of which
.4 are incorrect: (1) SWBT expects that the scheme will increase the reach of their ADSL service,

1 and (2) SWBT wants to limit the deployment of other services because it believes that such
2 service will degrade the performance of their ADSL service.

3 **Q. Will SFS provide any benefit to the reach or performance of ADSL services?**

4 A. No. As I stated in my earlier testimony, SFS benefits only upstream signals. Because the
5 reach and performance of ADSL is limited by its downstream signal, SFS provides no benefit.

6 **Q. What do you mean by "upstream" and "downstream" signals?**

7 A. The upstream signal contains data being sent from the customer premises, such as a
8 home or business, to the central office. The downstream signal contains data being sent from the
9 central office to the customer premises.

10 **Q. What do you mean when you say that SWBT's ADSL is downstream limited?**

11 A. ADSL is an asymmetric service that has a different reach in the downstream direction
12 than the upstream direction. Interference tables recently produced by SWBT show that TRI, Inc.
13 actually calculated the reach of both directions.[2] SWBT has chosen to sell specific combinations
14 of speeds that generally have a shorter reach in the downstream direction. Because SWBT's
15 service offers the downstream and upstream signals together, the signal with the shorter reach—
16 *i.e.*, the downstream signal—limits the length of the combined service.

17 **Q. How does this relate to Selective Feeder Separation?**

18 A. As I testified earlier, SFS only provides benefit for the upstream signal. Since SWBT has
19 chosen to offer a service with a more limited downstream signal, SFS does not provide a real
20 benefit. For example, if the upstream signal can reach 15 kft. and the downstream signal can
21 reach only 14 kft, it does not matter that SFS will prevent the upstream signal from degrading
22 from 15 to 14.5 kft. The combined service can still only be provisioned at 14 kft.

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[2] A true and correct copy of these tables are attached as Ex. 2.

1 **Q. Does SWBT's SFS plan provide any benefit to the ADSL upstream signal?**

2 No. If the actual loop plant conditions permitted the implementation of an ideal selective feeder
3 separation plan, and if plant records contained the loop plant data necessary to deploy the plan,
4 the separation of selected feeder cables may provide some marginal benefit to upstream signals
5 (assuming that the plan is deployed consistently). SWBT's SFS Plan, however, will provide no
6 benefit because it lacks these necessary elements: (1) it is not based upon actual loop plant
7 conditions and (2) SWBT lacks the loop plant data required to deploy the plan.

8 **B. SWBT's Spectrum Management Plan Is Designed to Protect SWBT's ADSL**
9 **Service at the Expense of Other DSL Services Offered By CLECs.**

10 **Q. Please describe the ADSL Interference Table that forms the basis of SWBT's**
11 **Spectrum Management Plan.**

12 A. TRI, Inc. (a SWBT affiliate) generated the SWBT ADSL Interference Table (Ex. 17A,
3 Attach. 1) under laboratory conditions, not actual conditions, by characterizing an ADSL loop
14 operating at SWBT service rates (*e.g.*, 1.5 Mbps/384 kbps) over the specific equipment that
15 SWBT is purchasing from one particular vendor. By artificially introducing specific amounts of
16 interference that allegedly correspond to interference caused by other types of service (*e.g.*, T1,
17 HDSL, IDSL) in the same or "adjacent" binder groups, TRI calculated the maximum theoretical
18 reach of SWBT's ADSL services.

19 **Q. What information does the SWBT ADSL Interference Tables provide?**

20 A. The SWBT ADSL Interference Table *purports* to provide the theoretical reach of its
21 ADSL service in the presence of services other than ADSL (*i.e.*, T1, HDSL or 2-pair SDSL, and
22 IDSL) in the same or adjacent binder groups (Ex. 17A, Attach. 1.) SWBT appears to infer from
23 the Interference Table that interference with SWBT ADSL service is reason to limit the
4 deployment of other services, which SWBT pejoratively names "disturbers." These so-called

1 "disturbers," however, are actually legitimate services offered by Covad, ACI (and in some
2 cases, SWBT) that should have the same opportunity for deployment in the loop plant as
3 SWBT's ADSL service.

4 **Q. You mentioned that SWBT reserves loop complements for ADSL exclusively. How**
5 **are the specific ADSL complements selected?**

6 A. Ms. White, SWBT's Outside Plant Planning Engineer, testified that by January 31, 1999,
7 before CLECs had the opportunity to deploy competing services, SWBT had already selected all
8 of the ADSL-Only complements in wire centers in which SWBT intends to offer ADSL.
9 According to Ms. White's testimony, SWBT used the ADSL Interference Table and the "ADSL
10 Report" from LEADS/LEIS, a SWBT database, to reserve for ADSL complements running to
11 the same distribution area with the least number of non-ADSL services.[3] This is the only
12 information SWBT used to reserve its ADSL-Only complements.

13 Importantly, SWBT reserved the ADSL complements using the "longest theoretical
14 loop"—*i.e.*, the longest loop in the ADSL-Only complement. For example, if a 100-loop
15 complement contained ninety-nine 4 kft. loops and one 15 kft. loop, SWBT used the ADSL
16 Interference Table to reserve the ADSL-Only complement assuming that all loops within that
17 complement were 15 kft. According to Ms. Asher, an employee of SWBT, when clean
18 complements were available, SWBT reserved as many loops for ADSL "as operationally
19 possible."

20 **Q. You stated that SWBT makes reservations for ADSL services according to loop**
21 **"complement." Why doesn't SWBT reserve ADSL loops according to "binder**
22 **groups" as assumed by the SWBT ADSL Interference Table?**

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[3] A true and correct copy of the ADSL Report is attached as Ex. 3.

1 A. SWBT can not make reservations according to binder groups because it lacks the
2 necessary loop plant data. SWBT's loop plant data consists only of a loop "complement"
3 numbering system (*e.g.*, Complement 1 = Loops 1-100, Complement 2 = Loops 101-200) that
4 does not provide information about the physical location of loops (*i.e.*, whether loops are in the
5 same or in an adjacent binder).

6 **Q. You stated that SWBT uses an "ADSL Report" to reserve ADSL complements.**
7 **What information does the "ADSL Report" provide?**

8 A. The "ADSL Report" provides a list of the number of loops in a particular complement
9 providing DS1, ISDN, DDS, and AML services, respectively. The ADSL Report does not
10 distinguish between "same" and "adjacent" complements. As stated in Ms. White's testimony, a
11 loop "complement" does not refer to a particular loop "binder." Thus, although the ADSL
12 Report provides information regarding the types of services in a particular complement, it does
13 not provide any information regarding physical location of those services in the same or
14 physically adjacent binder groups. As a result, SWBT's reservation of ADSL complements did
15 not rely on data showing the types of services that exist in the same or physically adjacent binder
16 groups as contemplated by the ADSL Interference Table.

17 **Q. How will SWBT's advance reservation of ADSL-Only complements and limitations**
18 **on surrounding complements affect other DSL services?**

19 A. In short, SWBT is favoring potential future ADSL service over present SDSL and HDSL
20 services. SWBT has already reserved as many "clean" complements "as operationally possible"
21 for their ADSL service. Importantly, the number of "clean" ADSL loops available is greater
22 when competing SDSL or HDSL services are not deployed. Thus, by reserving as many ADSL
23 complements "as operationally possible" before CLECs had the opportunity to deploy competing

1 services, SWBT necessarily increased the percentage of the loop plant reserved for ADSL.
2 According to the testimony of SWBT witnesses, SWBT will not allow CLECs to deploy other
3 DSL services in cable pair complements that SWBT assumes are adjacent to the ADSL-Only
4 complements if the other DSL services could theoretically degrade an SWBT ADSL service.
5 This restriction applies even if the ADSL service is not yet deployed. SWBT uses the data
6 provided in the SWBT ADSL Interference Table to make this determination. Accordingly, if a
7 CLEC like Covad or ACI is planning to provide SDSL or HDSL, SWBT's Plan not only
8 drastically reduces the number of loops available for such services but also may deny the
9 services entirely if SWBT arbitrarily determines them to degrade the performance of future
10 ADSL services.

11 **Q. Should SWBT be permitted to reserve large number of binder groups for ADSL?**

12 A. No. Unlike ADSL, symmetrical services such as SDSL, HDSL, and IDSL are their own
13 worst interferers. The closer these services are to one another, the more signal degradation
14 occurs. As SWBT reserves more complements for ADSL, it reduces the number of loops
15 available for symmetrical DSL services, forcing the symmetrical DSL loops together and
16 degrading their performance. Additionally, because SWBT's records do not contain sufficient
17 information to determine whether loops are actually adjacent in the loop plant, they should not be
18 placing any limits on the deployment of other technologies.

19 **Q. When does SWBT deny loops because of "spectrum exhaust"?**

20 A. Under SWBT's definition, "spectrum exhaust" occurs when the deployment of a service
21 other than ADSL would reduce the reach of SWBT's ADSL service below the "longest
22 theoretical loop length"—*i.e.*, the length of longest loop in an ADSL-Only binder. SWBT uses
23 the SWBT ADSL Interference Tables to determine when spectrum exhaust occurs.

1 **Q. How does this definition affect the availability of loops for DSL services other than**
2 **ADSL?**
3 A. As a general rule, for every 100 loops reserved by SWBT for ADSL, SWBT precludes or
4 drastically reduces the deployment of competing DSL services in approximately 700 loops (100
5 loops for the ADSL complement + 600 loops in surrounding complements). For example,
6 assume that SWBT has reserved a 100-loop complement for its 1.5/384 ADSL service (1.5 Mbps
7 downstream/384 kbps upstream) with a theoretical loop length (as described above) of 12.7 kft.
8 Also assume, as described in Ms. White's testimony, that six 100-loop complements exist above
9 and below the ADSL complement in the loop plant. Referring to the SWBT ADSL Interference
10 Table (Ex. 17A, Attach. 1), if ten (10) HDSL loops were deployed in the six 100-loop
11 complements above and below the ADSL-Only complement, spectrum exhaust for HDSL would
12 occur in over 700 loops because no additional HDSL loops could be deployed in any
13 complement while maintaining the SWBT ADSL service reach at 12.7 kft. By using this
14 definition of spectrum exhaust, SWBT has effectively eliminated or limited drastically the
15 deployment of other DSL services even though there are plenty of loops available.
16 **Q. Is SWBT's definition of "spectrum exhaust" valid?**
17 A. No. It is incorrect and invalid. ADSL has been designed by the standards bodies to work
18 in an outside plant with other DSL services. DSL providers like Covad and ACI make that
19 assumption and use realistic deployment guidelines under which spectrum exhaust will never
20 occur. SWBT is the only service provider that has raised the issue of spectrum exhaust.
21 SWBT's definition assumes that consumers want to use only ADSL services. This assumption
22 limits the number of consumers who can receive other types of DSL services, thereby
23 discriminating against consumers who prefer other DSL services.