

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

In the matter of the Application of
San Diego Gas & Electric Company
(U 902-E) for a Certificate of Public
Convenience and Necessity for the
Sunrise Powerlink Transmission
Project

Application No. 06-08-010
(Filed August 4, 2006)

**PHASE 2 REBUTTAL TESTIMONY OF THE
MUSSEY GRADE ROAD ALLIANCE**

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1 **TABLE OF CONTENTS**

2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

1. INTRODUCTION AND SCOPE OF REBUTTAL TESTIMONY 1

2. MGRA TESTIMONY SUPPORTS THE FINDINGS OF CLASS I SIGNIFICANCE FOR WILDLAND FIRE IMPACTS IN THE DEIR/EIS 1

3. SDG&E DOWNPLAYS AND OBFUSCATES THE RISK DUE TO TRANSMISSION LINE FIRES 2

4. ABSOLUTE FIRE RATES FOR THE PROPOSED SPL PROJECT, NOT COMPARATIVE FIRE RATES, ARE NEEDED TO INFORM THE SPL COST/BENEFIT ANALYSIS 4

5. SDG&E’S RECOGNITION OF THE NEED TO TAKE EXTRA FIRE SAFETY MEASURES IS LATE IN COMING -- AND THESE MEASURES MAY NOT BE IMPLEMENTED 5

6. LEAPS FIRE RISK OVER PROJECT LIFETIME IS NO GREATER THAN OTHER POTENTIAL ROUTES 7

7. SDG&E CALCULATIONS INDICATING THAT THE NORTHERN ROUTES EXPERIENCE SIGNIFICANTLY FEWER FIRES THAN SOUTHERN ROUTES ARE INCORRECT 8

8. SDG&E COST ESTIMATES BASED UPON INCORRECT FIRE RISK ASSUMPTIONS ARE UNRELIABLE 11

ATTACHMENTS

FILE	CONTENTS
FRAPFireHistoriesPerRoute5p60.xls	Cal Fire perimeters ½ mile from routes, 1960
FRAPFireHistoriesPerRoute380.xls	Cal Fire perimeters 3 miles from routes, 1980

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 1 of 18

1. INTRODUCTION AND SCOPE OF REBUTTAL TESTIMONY

This rebuttal testimony is presented by Dr. Joseph W. Mitchell on behalf of the Mussey Grade Road Alliance (“MGRA”) to address the direct Phase 2 testimony of SDG&E. In particular, it addresses and rebuts the claims made in the company’s Fire Risk chapter (Chapter 5) by witness Hal Mortier and others. We also address claims made in the Strategic Decision chapter (Chapter 13) regarding the assumed superiority of northern over southern routes. We also apply historical fire data to call into question cost estimates arising from the reliability issues put forward in Chapter 13.

**2. MGRA TESTIMONY SUPPORTS THE FINDINGS OF CLASS I
SIGNIFICANCE FOR WILDLAND FIRE IMPACTS IN THE DEIR/EIS**

In its Phase 2 direct testimony, SDG&E takes issue with the finding of significant (Class I) impacts due to fire risk associated with the proposed project and transmission line alternatives in the Draft EIR/EIS. The title of Chapter 5, the “Fire Risk” chapter, is “*SUNRISE DOES NOT POSE A SIGNIFICANT FIRE RISK AND FIRE IS NOT A SIGNIFICANT RISK TO SUNRISE*”

SDG&E’s testimony states on p. 5.1 that “*...it appears that the DEIR overstates both the risk of fires caused by the Sunrise transmission lines as well as the risk of fire to the Sunrise transmission lines. Although Southern California experienced major wildfires in 2003 and most recently in October 2007, the fires notably were not caused by 230 kV or 500 kV transmission lines such as those proposed by SDG&E in this proceeding.*” The MGRA, on the other hand, has noted that not only have two wind-associated 230 kV fires occurred within the SDG&E network in the last four years¹, the rates per mile of 230 kV line for these fires is not statistically different from those observed for 69 kV lines in the

¹ MGRA Phase 2 direct testimony, Appendix 2D, p. 8. SDG&E did not collect power line fire data prior to 2004.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 2 of 18

1 SDG&E network.² In fact, the MGRA chides the Draft EIR/EIS for accepting the
2 link between engineering superiority and fire resilience on faith rather than
3 looking at the existing SDG&E data³. The fact that fires have been ignited by 230
4 kV transmission line makes future catastrophic fires from them plausible. Using
5 independent lines of reasoning, the Draft EIR/EIS makes a finding of Class I
6 significant, immitigable impacts arising from the proposed project and all
7 transmission alternatives. The observation of wind-caused 230 kV fires as noted
8 above strongly supports this finding.
9

10 **3. SDG&E DOWNPLAYS AND OBFUSCATES THE RISK DUE TO**
11 **TRANSMISSION LINE FIRES**

12
13 MGRA has taken a quantitative, predictive approach to calculating the risk of
14 wildland fire starts from power lines and has been careful to explain its basic
15 assumptions and to detail both statistical and systematic uncertainties in its
16 calculations. SDG&E has been free to offer its own model as an alternative. It has
17 so far not done so. Instead, it adopts hand-waving, misleading arguments. On p.
18 5.1, for example, the company states that *“It is not reasonable to suggest that*
19 *Sunrise should not be built because power lines can theoretically cause or*
20 *contribute to fires, or to suggest that Aspen’s alternatives have significantly fewer*
21 *risks of fire when compared to Sunrise.”* Though the MGRA favors non-
22 transmission alternatives, neither its Phase 1 nor Phase 2 testimony claims that
23 transmission lines should not be build because they can cause fires. Rather, it
24 suggests a measured and systematic approach to determining the risk of power
25 line fires and their cost.⁴ By simply dismissing the risk, SDG&E prefers to
26 remain in the dark while it imperils residents of San Diego County, its ratepayer
27 base. The risk is not “theoretical” at all, as the October fires established that there

² Ibid., pp. 9-10.

³ MGRA Phase 2 direct testimony, Appendix 2E, p. 12-13.

⁴ MGRA Phase 1 direct testimony, Appendix G.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 3 of 18

1 was a risk of massive, simultaneous power-line fires, and SDG&E’s own fire
2 records show that 230 kV lines do cause fires.

3 SDG&E attempts to downplay the significance of these 230 kV fires, stating
4 that there were only three of them in four years and also says: “Two of the three
5 230 kV fires were static line caused fires, and one was due to third party contact
6 by a kite tail.”⁵ This implies a false distinction between static lines and other
7 components of the transmission infrastructure. The fact that static lines are
8 responsible is irrelevant - *any* component of the transmission system that starts a
9 fire must be considered a potential source of fire. Also missing from this
10 description is the fact, provided by SDG&E’s own fire history data, that the static
11 line fires occurred under windy conditions. Phase 1 MGRA testimony establishes
12 quantitative support for the correlation between power lines and wildland fires
13 and concludes that “Ignitions that occur during a Santa Ana event are seen to be
14 much more likely to escape initial attack and grow to large size. The initial attack
15 success rate of 98% for keeping the fire under 100 acres drops to very
16 approximately 64% under these conditions.... This establishes wind hazard as a
17 real threat – one that should be applied to any proposed SPL route. This should be
18 done in the EIR.”⁶

19 All of the MGRA fire analysis is based upon the model in which Santa Ana
20 winds cause a power line fault that ignites vegetation, and in which this fire grows
21 so rapidly due to wind that it escapes initial firefighting attack. SDG&E is correct
22 when it points out that other sources of wildland fire ignition, such as equipment
23 use⁷, are much more common. However, such ignitions are generally uncorrelated
24 with Santa Ana wind conditions, and so the fires tend to be smaller and more
25 easily controlled. It is the correlation between wind and power line fires as it
26 relates to the proposed SPL project that is of utmost concern to the MGRA, and
27 should be of concern to SDG&E. This particular threat, as demonstrated very

⁵ SDG&E Phase 2 direct testimony, p. 5.12.

⁶ MGRA Phase 1 direct testimony, Appendix D, “Power Line Fires” and Appendix F, “Santa Ana Winds”, p. 17.

⁷ SDG&E Phase 2 direct testimony, p. 5.6.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 4 of 18

1 clearly during the October 2007 Firestorm, in which purported power line fires
2 made up 8 of the 19 fires that occurred during the week of October 21st 2007
3 (42%, rather than the 1% fraction of power line fires overall) fires and which
4 burned 52% of the total area.⁸

5

6 **4. ABSOLUTE FIRE RATES FOR THE PROPOSED SPL PROJECT, NOT**
7 **COMPARATIVE FIRE RATES, ARE NEEDED TO INFORM THE SPL**
8 **COST/BENEFIT ANALYSIS.**

9

10 The SDG&E testimony notes that the fire rate from distribution lines is greater
11 than that from transmission lines,⁹ a fact quantitatively confirmed by MGRA
12 analysis of the SDG&E fire history.¹⁰ However, SDG&E is not proposing to
13 build a distribution project. It is proposing to build a very long transmission line
14 that cuts through a very long swath of highly flammable vegetation and would be
15 operated for 40 years. The question of relevance in the case of the SPL is not what
16 types of wildland fires or power line fires can be generally expected, but rather
17 how many fires we would expect *this* project to cause in the course of its lifetime.
18 This is exactly the question the MGRA analysis addresses quantitatively. The
19 SDG&E testimony, on the other hand, asserts that because catastrophic fires from
20 230 kV lines have not happened yet, the SPL “does not pose a significant fire
21 risk”¹¹ and dismisses the risk as “negligible”.¹²

22 Deductively, we know that SDG&E takes an incorrect approach. We know that
23 230 kV lines have caused fires under windy conditions, and we know that fires
24 that start under windy conditions will occasionally become catastrophic fires. We
25 therefore know that 230 kV power lines are capable of causing catastrophic fires.
26 MGRA uses existing SDG&E fire data to try to calculate how likely this is for

⁸ MGRA Phase 2 direct testimony, Appendix 2A, pp. 8-10.

⁹ SDG&E Phase 2 direct testimony, p. 5.5.

¹⁰ MGRA Phase 2 direct testimony, Appendix 2D, p. 9-10.

¹¹ SDG&E Phase 2 direct testimony, p. 5.4.

¹² Ibid., p. 5.1.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 5 of 18

1 SPL. MGRA’s analysis, based on the most recent SDG&E data, gives a predicted
2 return time between 3 and 55 years for wind-induced 230 kV fires¹³ assuming the
3 current 230 kV fire rate is typical of that which we can expect in the future.
4 SDG&E has been free to offer its own quantitative analysis, based on its own
5 data, in its Phase 2 direct testimony, but instead has relied on qualitative, general
6 statements about how safe 230 kV transmission lines are. This does not help the
7 Commission make an informed assessment of the safety of 230 kV and 500 kV
8 lines, and particularly those associated with the SPL proposal. This approach
9 deliberately avoids taking a realistic, hard look at the probabilities of power line
10 ignited fire in connection with this application. This is not a scientific approach or
11 even serious inquiry, but a continuation of an obvious strategy employed by the
12 company to avoid the issue.

13
14 **5. SDG&E’S RECOGNITION OF THE NEED TO TAKE EXTRA FIRE SAFETY**
15 **MEASURES IS LATE IN COMING -- AND THESE MEASURES MAY NOT**
16 **BE IMPLEMENTED**

17
18 In the aftermath of the October 2007 fires, SDG&E submitted a petition for an
19 Order Instituting Rulemaking (OIR) to the CPUC, as it describes on page 5.10 of
20 its testimony, requesting that the CPUC “issue a statewide OIR to consider
21 whether to adopt additional or modified regulations and rules with respect to
22 disaster preparedness and management to be implemented by public utilities
23 beyond the current requirements of GO 95.”¹⁴ This petition received support
24 from Southern California Edison¹⁵ and Pacific Gas and Electric¹⁶. Additionally, it

¹³ Appendix 2D, p. 13.

¹⁴ San Diego Gas & Electric Company; PETITION OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) TO ADOPT, AMEND, OR REPEAL A REGULATION PURSUANT TO PUBLIC UTILITIES CODE § 1708.5; November 6, 2007.

¹⁵ Southern California Edison Company; Response of Southern California Edison Company (U338-E) to Petition of San Diego Gas & Electric Company to Adopt, Amend, or Repeal a Regulation Pursuant to Public Utilities Code §1708.5; CPUC Petition 07-11-007

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 6 of 18

1 received the support of the Center for Biological Diversity and The Sierra Club¹⁷,
2 and the Mussey Grade Road Alliance¹⁸, which maintained that an investigation
3 into fire causes should precede any changes to regulations.

4 MGRA supports some of the proposals made by SDG&E, both in its petition
5 and on p. 5.10 of its Phase 2 direct testimony. However, it needs to be noted that
6 this initiative is late in coming, and the proposals at p. 5.10 are tentative:

7 “SDG&E is evaluating and comparing the fire-related practices of other
8 utilities...”; “SDG&E is studying the relationship between ‘Red Flag Warning’
9 days and outages...”; “SDG&E is studying re-closing measures that will reduce
10 fire risk...”; “SDG&E plans to replace wood pole structures with steel...”. All
11 excellent proposals, but they are late in coming, tentative and not yet in place.

12 While MGRA is gratified to see this acknowledgment of fire issues, we are
13 skeptical of SDG&E’s commitment to change. SDG&E is under tremendous
14 pressure in three areas where having a more proactive, fire-conscious image could
15 benefit it monetarily or strategically. First, it currently under litigation for the Rice
16 and Witch fires, as it acknowledges on p. 5.21 of the Phase 2 testimony.

17 Secondly, it is under some external pressure to underground substantial portions
18 of its network in high fire risk areas, as is evidenced by the Environmentally
19 Superior Northern Alternative proposed in the Draft EIR/EIS, which follows the
20 same general path as the proposed SPL route, but calls for nearly fifty miles of
21 line to be undergrounded¹⁹. SDG&E has indicated that this would be very
22 expensive²⁰ and wishes to show that it can address fire threats in other ways.

23 Finally, SDG&E wishes to obtain approval for this project, which is more likely if
24 it can demonstrate a commitment to fire safety, particularly since such a large

¹⁶ Pacific Gas and Electric Company’s Response in Support of Petition of San Diego Gas and Electric Company; CPUC Petition 07-11-007.

¹⁷ Response the Center for Biological Diversity and the Sierra Club to San Diego Gas & Electric Company’s Petition to Adopt, Amend, or Repeal a Regulation Pursuant to Public Utilities Code Section 1708.5; CPUC Petition 07-11-007.

¹⁸ Mussey Grade Road Alliance Response To San Diego Gas & Electric Petition To Adopt, Repeal Or Amend A Regulation Pursuant To Public Utilities Code § 1708.5; CPUC Petition 07-11-007.

¹⁹ Draft EIR/EIS; A.06-08-010 Sunrise; p. H-73; Figure H-1.

²⁰ SDG&E Phase 2 direct testimony; Chapter 3; pp. 3.30-3.31.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 7 of 18

1 portion of the Draft EIR/EIS is devoted to wildland fire issues and because the
2 DEIR/EIS classifies all transmission routes as having Class I immitigable impacts
3 due to wildland fire issues. In summary, SDG&E currently has a number of very
4 good reasons to appear interested in wildland fire safety with regard to its power
5 lines.

6 Unfortunately, interest is not commitment. It should be noted that any of the
7 activities mentioned in the SDG&E testimony could have been undertaken long
8 ago if SDG&E considered power line fire a serious threat. However, these
9 remedial measures, if implemented, would in most cases cause extra initial cost to
10 the company, and would affect the bottom line. Consequently, due to short-term
11 profitability concerns, there are real economic pressures working in the
12 background to curtail or abandon remedial measures -- particularly during
13 economic downturns. And while the prevention of wildland fire is certainly in
14 SDG&E's economic interest, the fact that the interval between significant events
15 is long makes it easy for the company to ignore the issue. Therefore SDG&E's
16 commitment to change in this crucial area cannot be blithely taken for granted.

17
18 **6. LEAPS FIRE RISK OVER PROJECT LIFETIME IS NO GREATER THAN**
19 **OTHER POTENTIAL ROUTES**

20
21 To highlight the fire risks associated with the LEAPS project, the SDG&E
22 witness Mortier on p. 5.17 quotes Draft EIR/EIS comments from a prospective
23 party: "As noted in Ms. Jacqueline Ayer's comments on the DEIR, 'there are
24 more miles of both high and very high burn probability area in the short (31.8)
25 mile Lake-Pendleton segment than in the entire 150 mile length of the proposed
26 Sunrise Project.'"

27 MGRA asserted in its testimony that there is significant bias associated with
28 the survey method used to determine burn probabilities in the Draft EIR/EIS.²¹
29 Specifically, it notes that in areas which have recently burned such an analysis

²¹ MGRA Phase 2 direct testimony; Appendix 2E, p. 13.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 8 of 18

1 will measure smaller fuel loads than they would have before the fire. The
2 vegetation present at the current time is atypical of that which would exist over
3 the lifetime of the proposed transmission line. Such a bias also exists in the Cal
4 Fire maps that have been used by MGRA and SDG&E to estimate fire threat.
5 SDG&E witness Mortier confirmed during Phase 1 cross examination that
6 vegetation in the recent aftermath of a burn is not typical of that which is expected
7 over the 40 year project lifetime.²²

8 MGRA route comparisons using Cal Fire and other data indicate that the
9 LEAPS route has significant fire risk. However, the total length of LEAPS that
10 would be exposed to high potential fire risk or vegetation loading is roughly half
11 that of the proposed SPL route or the Environmentally Superior Southern
12 Alternative, and roughly equivalent to that of the Environmentally Superior
13 Northern Alternative.²³

14
15 **7. SDG&E CALCULATIONS INDICATING THAT THE NORTHERN ROUTES**
16 **EXPERIENCE SIGNIFICANTLY FEWER FIRES THAN SOUTHERN**
17 **ROUTES ARE INCORRECT**

18
19 One of the arguments that SDG&E has used to bolster its case for the proposed
20 northerly SPL route is that a southern route is exposed to more hazardous fire
21 conditions and to more fires. We have shown in the MGRA testimony that the
22 northern and southern routes are roughly equivalent in exposure to fire hazards.²⁴
23 As to the number of fires, the SDG&E testimony states on p. 5.13 that, "*The*
24 *Proposed Route has experienced approximately one half the number of fire*
25 *occurrences, 10 acres or larger within a 3 mile radius, compared to the*

²² Cross Examination of witness Mortier; Public Utilities Commission, State of California; A0608010; July 17, 2007; T.at 1007.

Exhibit MG – 10; CDF Fire Threat - Pre-Cedar (2003)/Pines(2002) Fires;

Exhibit MG – 11; CDF Fire Threat - Post Cedar (2003)/Pines (2002) Fires;

Exhibit MG – 12; CDF Fire 2003 - Pre-Cedar/Pines Enlarged "Sunrise" Northern Loop.

²³ MGRA Phase 2 direct testimony; Appendix 2C; pp. 9-12.

²⁴ MGRA Phase 2 direct testimony; Appendix 2C; pp. 9-12.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 9 of 18

1 *Southwest Powerlink from 1980-2006. The number of fire occurrences in the*
2 *other northern routes is comparable.”* The cited data source for this information
3 was Cal Fire’s FRAP data.

4 MGRA does not arrive at the same results using the same data and analysis
5 purportedly used by SDG&E and argues that the selection of swath width studied
6 (three miles) and fire size (10 acres or larger) are both inappropriate. According
7 to Cal Fire, the criterion for entry into the fire perimeter database is that it
8 “include[s] timber fires 10 acres and greater in size, brush fires 50 acres and
9 greater in size, grass fires 300 acres and greater in size, wildland fires destroying
10 three or more structures, and wildland fires causing \$300,000 or more in
11 damage.”²⁵ This admonition as to data criteria and usage is printed verbatim in
12 every MGRA Phase 1 and Phase 2 appendix in which these data are used.²⁶

13 Brush fires smaller than 50 acres appear regularly in the Cal Fire FRAP
14 database. However, their collection and inclusion is not consistent, and may vary
15 agency by agency or by location and time. Because they are below the official
16 acceptance criteria for data, they should not be used for statistical analysis or
17 conclusions. MGRA Phase 2 power line fire analysis compensated for this effect
18 by placing a 100 acre cut on fire sizes.²⁷ We now apply the same approach that
19 SDG&E takes, taking all fires since 1980 within a 3 mile swath on either side of
20 each route²⁸, and tally the results below.

²⁵ Cal Fire FRAP program; http://frap.cdf.ca.gov/projects/fire_data/fire_perimeters/
The warning as to data criteria is found in the metadata of this file.

²⁶ See for example, MGRA Phase 2 direct testimony; Appendix 2C; p. 1.

²⁷ MGRA Phase 2 direct testimony; Appendix 2B; p. 8.

²⁸ See attached data file FrapFireHistoriesPerRoute380.xls for details.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

1

FIRES SINCE 1980 WITHIN 3 MILES OF ROUTE

Route	Fires < 50 acres	Fires >50 acres	Fraction < 50 acres
SPL	15	57	21%
SWPL	27	66	29%
ESSA	33	72	31%
ESNA	10	42	19%
LEAPS	3	47	6%

2

3 We see that the fraction of small fires (<50 acres) recorded for both ESSA and
4 SWPL southern routes is 50% larger than the fraction of small fires recorded for
5 the northern routes. This explains most of the claimed excess of fires along the
6 southern routes. We also see that the statement that the proposed route has
7 “approximately half” of the fires of a southern route would be false even if the
8 smaller fires are included: The SPL proposed route has 72 FRAP-recorded fires,
9 whereas the ESSA route has 106 and SWPL has 93. This is not “approximately
10 half”, except if one adopts a very broad definition of “approximate”. Looking at
11 the difference between the proposed SPL route and the ESSA, using only fires
12 over 50 acres we see that the excess of fires along the southern route is only 25%,
13 and not a factor of two as stated in the SDG&E testimony.

14 It should be noted that SDG&E has not been consistent in how it defines
15 “Proposed Route”. For instance, during Phase 1 testimony and cross
16 examination,²⁹ it was revealed that the fire analysis that SDG&E had conducted
17 for the “Proposed Route” included only the 500 kV segment of the line, which
18 extends only to Santa Ysabel. The 230 kV segment, which extends westward from
19 Santa Ysabel through the more populated Ramona, Scripps Ranch, Rancho
20 Penasquitos, and Del Mar Mesa, was not analyzed by SDG&E.

²⁹ Cross Examination of witness Mortier; Public Utilities Commission, State of California; A0608010; July 17, 2007; T.at 997.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 11 of 18

1 It could be argued that there are more fires of 50 acres and smaller in the
2 FRAP records for the southern routes because there are many more such fires
3 along the southern routes. The SDG&E testimony alludes to this on p. 5.13:
4 “historically fire risk is greater in the south county and in the border area in
5 general. Campfires, transient traffic, and wildfires moving into the United States
6 from Mexico are responsible for a disproportionately large number of fires in or
7 adjacent to the border area.” MGRA argues that the buffer width of three miles on
8 either side of the route in question used in the SDG&E testimony is too wide for
9 the smaller fires in the sample to be relevant as a fire risk to a transmission line.
10 From simple geometric considerations, a 50 acre fire within a six-mile wide
11 buffer, such as that purportedly used in the SDG&E calculation, has only an 11%
12 chance of being within 1000 feet of the transmission line³⁰.

13 In summary, the MGRA analysis shows that the excess of historical power line
14 fires along the Environmentally Superior Southern Route has only been 25%
15 larger than that for the proposed northern route for the SPL, and not a factor of
16 two as stated in the SDG&E testimony. SDG&E improperly included fires of 50
17 acres and smaller in their analyses, which are below the limit, recommended by
18 the data provider and also pose a negligible risk from a geometrical standpoint.

19
20 **8. SDG&E COST ESTIMATES BASED UPON INCORRECT FIRE RISK**
21 **ASSUMPTIONS ARE UNRELIABLE.**

22
23 SDG&E claims that there is a significant economic benefit to be obtained by
24 choosing the proposed or an alternative northern project route as opposed to any
25 southern alternative:

26 *“According to the WECC Reliability Subcommittee, because Aspen’s Southern*
27 *Route is at a much higher risk of a common corridor outage than the northern*

³⁰ For a swath on either side of the power line of width W miles, a randomly distributed fire of area A acres (assuming a circular fire perimeter) whose footprint impinges on the swath has a probability P of being within D feet of the transmission line: $P = (D + 220\sqrt{A/\pi}) / (5280W + 220\sqrt{A/\pi})$.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 12 of 18

1 *routes, it would be subjected to a protection scheme that could result in up to*
2 *1000 MW of load being dropped in the event of a simultaneous outage of this*
3 *route and the Southwest Powerlink.”³¹*

4 *“The planned category C remedial action scheme required for the Southern*
5 *Route will automatically drop up to 1000 MW of load, creating a major outage in*
6 *San Diego when both lines are interrupted and load is above 3,100 MW... The*
7 *high fire-danger areas that these lines must cross make this risk more severe.*
8 *Diversification of transmission paths is particularly desirable [sic], as*
9 *exemplified by the recent 2007 fire season, which took SWPL out of service for*
10 *more than four days.”³²*

11 **And:**

12 *“The proposed category C operating RAS imposed on the Sunrise Southern*
13 *route would result in customer outage costs between \$3 and \$6 million/hour each*
14 *time a fire or other failure results in a dual outage of SWPL and the Sunrise*
15 *Southern Route.”³³*

16
17 We conclude from the above testimony that the WECC decision to propose a
18 category C RAS on the southern route alternatives is 1) currently only a proposal
19 and 2) predicated on the erroneous theory that the southern route poses a
20 substantially greater fire risk, and therefore is at significantly greater risk of
21 outages.

22 We have already shown that the fire hazards of the ESSA are equivalent to
23 those of the proposed SPL route in our Phase 2 direct testimony³⁴, and in the
24 preceding section have shown that the excess of fires along the ESSA has only
25 been 25%, and not double those of the proposed route as claimed in the SDG&E
26 testimony.³⁵ We would assume that the WECC’s fire risk assessment was derived

³¹ SDG&E Phase 2 direct testimony; p. 10.15

³² SDG&E Phase 2 direct testimony; p. 13.11.

³³ SDG&E Phase 2 direct testimony; p. 13.19.

³⁴ MGRA Phase 2 direct testimony; Appendix 2C; p. 12.

³⁵ SDG&E Phase 2 direct testimony; p. 5.13.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 13 of 18

1 from the SDG&E analysis itself. Therefore, if this risk assessment is significantly
2 revised downward, then it is much less likely that a special classification would be
3 imposed on a southern route.

4 Determining how relative fire risks contribute to the cost estimate by witness
5 Oatman is difficult, in that no attempt was made on the part of SDG&E to
6 differentiate between outages caused by fires and outages from all other causes in
7 this analysis.³⁶ This is striking, in that the entire justification for applying extra
8 costs to the southern route is its purportedly greater susceptibility to fire. MGRA
9 therefore has conducted its own analysis using historical fire data to see if there
10 are any justifications for assuming a larger number of common-mode outages for
11 ESSA and SWPL, and we compare these to other routes as well to show relative
12 fire risks.

13 One hazard that impacts the southern alternatives more than the northern is the
14 potentiality that a large fire will extend over both of the routes, causing a
15 common-mode outage. We have examined historical fire data since 1960, and
16 find that such occurrences have occurred twice in the history of the SWPL and
17 ESSA routes. As per our earlier discussion of appropriate constraints on FRAP
18 data in Section 7, we have selected only fires larger than 50 acres, and we have
19 also constrained our sample to fires encroaching within ½ mile of the existing or
20 proposed route. We are concerned with actual historical impingement of fires on
21 the route, rather than a general fire rate in the area, so the narrower swath is more
22 appropriate in this case.³⁷

23 Fires for which one fire perimeter encroached on two routes are indicated as
24 “Type 1 (Tp=1)” potential outages in the table below, and are indicated by pink
25 highlighting. This process contributes to the outage scenario referred to by
26 SDG&E and WECC.

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³⁶ SDG&E response to MGRA Data Request #8.

³⁷ The data for all fires along each route under these constraints may be found in the attached file FRAPFireHistoriesPerRoute5p60.xls.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

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COMPARISON OF HISTORICAL FIRE COINCIDENCES
FOR SWPL AND PROPOSED AND ALTERNATIVE SPL ROUTES

SWPL Fire	Year	SPL Fire	Tp	ESNA Fire	Tp	ESSA Fire	Tp	LEAPS Fire	Tp
Laguna	1970					Laguna	1		
Tecate	1975							Tenaja	2
Proctor	1980	Assist #138	3						
Proctor #2	1981							Case	3
Miller	1985							Gavalin	3
Forrestgate	1995					Ribbonwood	2		
Sycamore	1995	Poway	3	Poway	3	El Monte	2		
Mine/Otay	2003	Cedar	2	Cedar	2	Cedar	2	Roblar #2	2
Harris	2007	Witch	2	Witch	2	Harris	1		
Total Tp 1			0	0		2		0	
Total Tp 2			2	2		3		2	
Total Tp 3			2	1		0		2	
Total 2+3			4	3		3		4	
Totals			4	3		5		4	

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We also examine the fire history to determine whether other fires were burning at the same time, or nearly the same time, as the fire which impinged on the current SWPL route. This helps determine the extent to which simultaneous fires contribute to common-mode outages. These are characterized as “Type 2” if the fires occurred on exactly the same day or if their burn periods overlapped, and are indicated by orange highlighting. These fire pairs could have potentially caused common-mode outages had transmission lines been in place at the time when they occurred. “Type 3” fire pairs occur when one fire starts within three days of the other. This last time is intended to compensate for shortcomings in the FRAP

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

Page 15 of 18

1 data³⁸, and also to help indicate the presence of “fire clusters” due to weather
2 conditions. The difference between ‘Type 2’ and ‘Type 3’, then, is simply
3 random chance. Hence, the ‘Type 3’ coincidences are useful indicating the
4 relative outage risk along the different routes because they increase the available
5 statistics, though they should not be used for rate predictions. Hence they still
6 help to determine whether the “diversification of transmission paths” which
7 witness Oatman calls “desirable”³⁹ actually provides added reliability benefit.

8 The table on the previous page gives the name of the coincident (or nearly
9 coincident) fire encroaching on each route, along with the coincidence type.

10 As can be seen, only two large fires in 40 years encroached upon both routes
11 simultaneously: the Laguna fire in 1970 and the Harris fire in 2007. ***Remarkably,***
12 ***however, all routes had potential common-mode outages due to simultaneous***
13 ***fires at approximately the same rate as the single-fire common mode outages***
14 ***affecting the southern routes.*** There is an equally remarkable consistency of rate
15 (two or three fires in forty years) between the various routes chosen (including
16 both Type 2 – ‘simultaneous’ and Type 3 – ‘near-simultaneous’ fires) , which
17 supports the MGRA assertion that the routes are roughly equivalent in fire risk.

18 These data clearly demonstrate that the occurrences of October 2007 and
19 October 2003 were not unique events. The October 2003 fires encroached on *all*
20 proposed routes. In October 2007, SWPL, the northern and southern routes were
21 all encroached upon simultaneously, as was acknowledged in Section K of the
22 SDG&E testimony on pp. 37-39. A similar event occurred in 1995, when
23 independent fires encroached on three routes simultaneously.

24 The probability of these simultaneous outages occurring randomly is extremely
25 small. What this means is that wildland fires tend to happen at the same time,

³⁸ Two particular shortcomings need to be noted in the FRAP data. First, prior to 1980, the exact start date of the fires was often not noted in the records. Only the years were recorded. Hence, classification of Type 2 and Type 3 coincidences would tend to be fewer in the 1960-1980 time period. Another issue is that the containment date is often not indicated. This indicates in some cases that containment was on the start date, but in others that this data is missing. Hence, some ‘Type 3’ coincidences might actually be ‘Type2’, in that they indicate fires that simultaneously affected two independent routes.

³⁹ SDG&E Phase 2 direct testimony; p. 13.11.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

1 even if they are physically separated. The mechanism causing this correlation has
2 been discussed at length by MGRA in Phase 1⁴⁰ and Phase 2⁴¹ testimony: Santa
3 Ana wind events. This should come as no surprise to San Diegans, who suffered
4 through the Cedar, Paradise, and Otay fires at the same time due to a wind event
5 in October 2003, and then the Witch, Rice, Harris, Poomacha, Guejito, Ammo,
6 and Coronado Hills fires due to a wind event in October 2007.

7 For single fire contingencies that would affect only the southern route, if we
8 apply the historical fire rate we would expect only 1.7 such events to occur over
9 the 40 lifetime of the proposed line. The 90% CL maximum value for such a
10 mean rate would be 4.0 events.⁴² On p. 13.19 of the Phase 2 testimony witness
11 Oatman states that common-mode outages would cause: “customer outage costs
12 between \$3 and \$6 million/hour each time a fire or other failure results in a dual
13 outage of SWPL and the Sunrise Southern Route”.

14 One question that arises is how long the simultaneous outages would last in a
15 serious wildland fire situation. To estimate this, we use data from the Witch fire,
16 provided as part of the SDG&E Phase 2 testimony. This is compared to the cost
17 estimate for a 24-hour outage under the WECC RAS proposal as described by
18 witness Oatman above.

⁴⁰ MGRA Phase 1 direct testimony; Appendix F, “Santa Ana Winds”.

⁴¹ MGRA Phase 2 direct testimony: Appendix 2G, “SPL and Winds” and Appendix 2E, p. 11.

⁴² To calculate the 90% confidence level value, we calculate the probabilities using the Poisson.rb calculator attached to the MGRA work papers. The “Mean Fires” value is used as the mean, and the confidence level is determined iteratively by choosing larger and larger values as the lower boundary. Once a probability calculation smaller than 10% is obtained, a linear interpolation is performed between the probability at the highest value and the probability at the value one less than the highest. Linear interpolation is an approximation in this case, but the resulting error will be <5%.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

	Calculated	Actual
Simultaneous Outages	24 hrs	15 hrs, SONGS ⁴³ 71 hrs, Creelman 69kV (N. route) ⁴⁴
Load Shedding	24 hrs / 1000 MW	33 min / 199 MW ⁴⁵
Cost	\$72 M - \$144 M	\$1.4 M - \$4.9 M ⁴⁶

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We can now calculate the potential costs that the RAS would impose on the southern route for fires impinging on both routes simultaneously and compare this to the overall cost estimates of witness Oatman.

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For the typical case of 1.7 events, and assuming \$4.5 M/hr as a typical customer outage cost, with each event lasting 24 hours, we would calculate an expected cost of \$183 M over the lifetime of the project. The “worst case” will use the \$6 M/hr rate, with 4.0 events occurring over the lifetime of the project. The costs of this worst case contingency would be \$576 M.

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Interestingly, these estimates are far lower than the expected costs estimated by Oatman on p. 13.19: “It is our finding that a range of probable customer major outage losses over the life of the line for the Southern Route Alternative, range from \$360 million to \$3 billion, with a base case of \$1.37 billion. This result is based on historical patterns of outage frequency and duration along SWPL, conservative assessments of the probability of joint interruptions, the economic value of power and the automatic nature of the 1000MW load drop when the RAS is triggered.”

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The discrepancy between the SDG&E figures and those calculated for predictable common-mode fire outages is a factor of 5 to 7. This can be understood by the fact that the SDG&E analysis takes into account *all* outages, and not just those caused by fire. ***Hence, the great majority of the added costs that would be accrued under an RAS would not be due to added reliability costs***

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⁴³ SDG&E Phase 2 direct testimony, p. 5.37.

⁴⁴ Ibid., p. 5.36.

⁴⁵ Ibid., p. 5.34.

⁴⁶ Ibid., p. 5.33, Table 5-2.

**PHASE 2 REBUTTAL TESTIMONY OF
THE MUSSEY GRADE ROAD ALLIANCE
A.06-08-010**

1 *associated with the southern route's fire risk, but would instead be arbitrarily*
2 *imposed on the southern route for simultaneous outages that would also have*
3 *occurred along other potential routes.*

4 The proposed penalty that would be imposed by the RAS is greatly out of step
5 with the actual differential fire risk associated with the southern route. The
6 company could argue this point strongly to the WECC. Instead, it has publicly
7 stated that the fire risk for southern routes is double that for northern routes⁴⁷, a
8 claim that the analysis in this document and attached workpapers strongly
9 contradicts.

10 The MGRA analysis has shown that all of the transmission routes have serious
11 and significant fire risks, and that the longest routes – the southern (ESSA) and
12 proposed SPL route have the greatest exposure to hazardous vegetation and other
13 risk factors. The fact that SDG&E has overplayed the fire risk of one route over
14 another to such an extent that the WECC would consider imposing a financial
15 penalty on one route on the basis of fire risk suggests that SDG&E may be trying
16 to use risk assessments based on incorrect or misinterpreted data to force a route
17 selection that suits its own purposes.

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⁴⁷ SDG&E Phase 2 direct testimony, p. 5.13.