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SOAH DOCKET NO. 473-10-1097
PUC DOCKET NO. 37448

APPLICATION OF LCRA §
TRANSMISSION SERVICES § BEFORE THE STATE OFFICE
CORPORATION TO AMEND ITS §
CERTIFICATE OF CONVENIENCE §
AND NECESSITY FOR THE §
GILLESPIE TO NEWTON 345-KV §
CREZ TRANSMISSION LINE IN § OF
GILLESPIE, LLANO, SAN SABA, §
BURNET, AND LAMPASAS §
COUNTIES, TEXAS §
§
§ ADMINISTRATIVE HEARINGS
§
§
§

DIRECT TESTIMONY
OF
MARK TURNOUGH, PhD

ON BEHALF OF

CJ RANCH, L.L.C.
MOUNTAIN PLACE, INC.
HANK AND LINDA WEGHORST
MARGARET WILKINSON
POINT PEAK MOUNTAIN RESORT, L.L.C.
BARBARA BARRON
ALLEN PAKSIMA
KDCB GARRETT RANCH, LTD.
J17 FORTUNE, L.P.
AND
R. G. MUELLER, JR. PARTNERSHIP

JANUARY 7, 2009

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**DIRECT TESTIMONY OF MARK TURNBOUGH, PhD
ON BEHALF OF CJ RANCH, [continue w/ all intervenors]
PUC DOCKET NO. 37448**

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Mark Turnbough. My business address is Post Office Box 220424, El Paso, Texas, 79913.

Q. WHAT IS YOUR OCCUPATION?

A. I am self employed as an environmental consultant.

Q. PLEASE DESCRIBE THE DISCIPLINARY AREAS IN WHICH YOU PROVIDE CONSULTING SERVICES.

A. Much of my work can be characterized as regulatory permitting and compliance, land use analysis, socioeconomic impact assessment, statistical analysis, regulatory impact assessment, policy analysis, water resource development and multi-disciplinary project management. (Exhibit MT-1 contains a summary of my consulting work and Exhibit MT-2 contains my resume.)

Q. HOW LONG HAVE YOU WORKED AS AN ENVIRONMENTAL CONSULTANT?

A. Thirty (30) years.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL QUALIFICATIONS AS WELL AS YOUR CONSULTING EXPERIENCE.

A. I received a PhD from Texas Tech University in 1985 in Systems Theory and Environmental Policy. My dissertation focused on environmental resources management. I have undergraduate and masters degrees from Texas Tech in Anthropology and Sociology with a specialization in the quantitative analysis of social and economic indicators.

I have taught a number of graduate and undergraduate courses in Land Use Planning, Anthropology, Social and Economic Assessment and Environmental Policy.

As a consultant, I have had significant participation in over 100 projects. During the past thirty (30) years, I have participated in the preparation of over 100 technical papers and reports for clients in the public and private sectors. I am a senior adviser to the Environmental Management Division of the U.S. Department of Energy (DOE) Headquarters in Washington, D.C., where I am retained as a nationally recognized expert (according to DOE criteria) in regulatory analysis and compliance management. In that role, I am working with DOE's Pantex Facility to develop a 115 MW Wind Energy Park. In addition, I am also the senior compliance consultant to DOE's Los Alamos National Laboratory and Waste Isolation Pilot Plant both located in New Mexico.

In the mid-1980's I participated in several transmission line projects as a consultant with Espey, Huston & Associates in Austin, Texas. Much of that work was done with Rob Reid of PBS&J for LCRA Projects.

In 2004, I was retained by the law firm of Carroll, Gross & Reeder on behalf of Lawrence and Carolyn Biedenharn in Re: a 138-KV transmission line proposed by LCRA Transmisssion Services in Kendall and Bexar Counties (SOAH Docket No. 473-04-7609 / PUC Docket No. 29684 Public Utility Commission of Texas).

Prior to, and since then, I have been very active in site selection, site suitability analysis and related land use analyses for more complex non-linear facility siting efforts. For example, in 2006 I was selected by AREVA and the Washington Group to manage the characterization of and selection of a site for DOE's Global Nuclear Energy Partnership ("GNEP") for the next generation nuclear reactor. A suitable "greenfield" site was selected and fully characterized for the GNEP in southeastern New Mexico. It received the highest level of DOE funding for site suitability analyses of any of the alternative sites at existing DOE facilities.

From 1991 to the present, I have managed or participated in the permitting of over seventy (70) percent of the total disposal capacity of Sub-Title D facilities in the state of New Mexico. For the most part, my work consists of assisting applicants secure regulatory approval of their projects and then help them maintain compliance with applicable regulatory frameworks. Only occasionally do I work for intervening parties, and I do that only if the available fact pattern suggests that an applicant has made a regulatorily unjustifiable decision.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide an evaluation of selected aspects of the methodology and results of the PBS&J "Environmental Assessment and Alternate Route Analysis for the Proposed Gillespie to Newton 345-KV CREZ Transmission Line in Gillespie, Llano, San Saba, Burnet and Lampasas Counties, Texas, Docket No. 37448" submitted as part of the LCRA TSC Application for a Certificate of Convenience and Necessity for a Proposed Transmission Line that was filed by LCRA TSC under the docket cited above in this document. In addition, my testimony addresses issues raised by the PBS&J and LCRA TSC decision to designate a preferred route for its filing that does not appear to be the most suitable route.

More specifically, the analysis summarized in my testimony indicates that PBS&J misapplied and omitted significant data in the evaluation of the preferred route and alternative route GN6.

Ultimately, the conclusion reached in my testimony is that LCRA TSC and its contractor selected a less suitable route (GN11) than alternative GN6 described by PBS&J in its EA and Route Analysis.

To that end, the balance of my testimony illustrates the basis of the statement that the LCRA TSC preferred route is less suitable than alternative Route GN6.

Q. WAS YOUR TESTIMONY AND SUPPORTING DOCUMENTATION PREPARED BY YOUR OR UNDER YOUR SUPERVISION?

A. Yes.

Q. IS THE INFORMATION CONTAINED IN YOUR TESTIMONY AND THE SUPPORTING DOCUMENTATION TRUE AND CORRECT TO THE BEST OF YOUR KNOWLEDGE AND BELIEF?

A. Yes.

III. EVALUATION OF PBS&J REPORT AND LCRA TSC SELECTION OF ROUTE GN11

Q. WHY DID YOU PREPARE AN EVALUATION OF THE PBS&J E.A. AND ROUTE STUDY AND THE LCRA TSC DECISION TO SELECT ROUTE GN11 AS ITS PREFERRED ALTERNATIVE?

A. Mr. William B. Steele, III, Attorney at Law with Locke, Lord, Bissell & Liddell, L.L.P. contracted with me to evaluate the process and work product used by LCRA TSC to designate Route GN11 as the preferred alternative for its filing with the PUC for A CCN. Mr. Steele represents CJ Ranch. CJ Ranch is located on link C16. Other Intervenors in this Docket have also contracted with me for the same evaluation: CJ Ranch, L.L.C.,

Mountain Place, Inc. , Hank and Linda Weghorst, Margaret Wilkinson, Point Peak Mountain Resort, L.L.C., Barbara Barron, Allen Paksima, KDCB Garrett Ranch, LTD., J17 Fortune, L.P., and R.G. Mueller, Jr. Partnership. These parties own land on links C15, C16, and C22.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR EVALUATION.

A. The purpose of my evaluation was to determine if the PBS&J study and the LCRA TSC use of that information led to the selection of the most suitable route.

Q. WHO PARTICIPATED IN THE PREPARATION OF YOUR EVALUATION?

A. I prepared the evaluation.

Q. PLEASE DESCRIBE THE STEPS TAKEN TO PREPARE THE EVALUATION.

A. Steps taken include:

- The first task was to review applicable statutory and regulatory requirements for selection of a preferred route.
- The second task was to review the LCTA TSC Application including the PBS&J Report, and begin the evaluation of the PBS&J documents.
- The third task was to review other information that would help in the evaluation of the LCRA TSC decision.
- The fourth task was to do a field reconnaissance of the property that would be affected by construction of Route GN11 and alternate routes identified by PBS&J, in order to essentially "ground truth" the published data base.

- The fifth task was to complete the evaluation of the PBS&J Report and the LCRA TSC decision.

Q. WHAT DOCUMENTS IN ADDITION TO THE PBS&J REPORT AND THE LCRA TSC APPLICATION DID YOU REVIEW?

A. I reviewed the following documents:

- Chapter 25. Substantive Rules Applicable to Electric Service Providers.
Subchapter E. Certification, Licensing and Registration
(PUC Subst R.Sec.25.101(b)(3)(B))
- PURA Section 37.056(c)
- Application of LCRA Transmission Services Corp. to Amend its Certificate of Convenience and Necessity for the Gillespie to Newton 345-KV CREZ Transmission Line
- PBS&J Environmental Assessment and Alternative Route Analysis for the Proposed Gillespie to Newton 345-KV Transmission Line Project
- LCRA TSC First Errata
- LCRA TSC Second Errata
- LCRA TSC Responses to W.R. Hinckley's First and Fourth Requests for Information
- LCRA TSC Response to Chanas Ranch, LP's First Request for Information
- Texas Parks & Wildlife January 21, 2009 Comments re: CREZ Transmission Plan – Scenario 2, Docket No. 33672

- Texas Parks & Wildlife December 23, 2009 Comments re: PUC Docket No. 37448 – Application of LCRA TSC to Amend its Certificate of Convenience and Necessity for the Gillespie to Newton 345-KV CREZ Transmission Line

Q. PLEASE DESCRIBE THE BASIS FOR AND METHODOLOGY DEVELOPED FOR CONDUCTING THE EVALUATION OF THE PBS&J ROUTE STUDY.

A. The key to understanding the PBS&J route study and ultimately the LCRA TSC decision to select Route GN11 as its preferred alternative for the CCN filing is Table 6-1 (rev. 1) and an unnumbered table that contains data for the 38 criteria, by link, in the PBS&J Report and supporting work product. Inspection of values assigned to the 38 criteria in the table for each route provides a good point of departure for further analysis. Using the PBS&J data base, I reviewed the alternative routes, and GN11 which was designated as the preferred route. Initially, I assumed that the range of alternatives identified by PBS&J including GN11 represent a reasonable set of options for consideration in the study area. For the most part, inspection of aerial photography and topographic maps included in Attachments 1 and 4 of the PBS&J Report validated that assumption.

Q. WHAT IS THE BASIS OF THE 38 CRITERIA USED IN THE PBS&J REPORT?

A. The 38 criteria represent an approach developed by PBS&J to establish a measurable set of variables that reflect or “operationalize” the broader requirements of Chapter 25, Subchapter E, PUC Subst R.Sec25.101(b)(3)(B) and PURA Section 37.056(c).

Q. DO YOU THINK THAT THE 38 CRITERIA REPRESENT A REASONABLE APPROACH TO EVALUATING ALTERNATIVE ROUTES FOR TRANSMISSION LINES?

A. In general, the criteria are useful as a preliminary framework, but they are limited by the fact that their relative importance as individual criteria have never been made explicit. For the most part, the values for each criterion are easy enough to replicate, verify or correct, but there is no standard for a "reasonable third party" to follow in determining what criterion is most or least important in assessing a given set of routes. Ultimately it comes back to the collective judgment of the PBS&J project team, and the input from its customer which in this case is the LCRA TSC. As a consequence, the actual analysis has limited transparency, irrespective of the public meeting process used to communicate proposed decisions.

Q. CAN YOU GIVE EXAMPLES OF SYSTEMATIC LIMITATIONS EMBEDDED IN THE PBS&J APPROACH, INCLUDING THE CRITERIA?

A. Yes. For one, the approach has the potential to pit what I think are important land use criteria against each other. In this case, according to PBS&J, Route GN11 (delineated as the preferred route) affects fewer habitable structures than GN6, 45 structures to 163 structures, respectively. However, GN6 uses and runs parallel to more existing transmission line right-of-way, other compatible right-of-way, and property lines than GN11, 66.00 miles and 39.52 miles, respectively. Many of the habitable structures (approximately 113) affected by GN6 are already adjacent to existing

transmission line rights-of-way and/or may be collected by expanding the centerline parameter from 300 to 500 feet for the 345-KV requirement. Consequently, approximately 54 percent of the length of GN11 would be constructed on new right-of-way compared to approximately twenty-two (22) percent new right-of-way on GN6, yet GN11 is still selected for other reasons including the number of habitable structures.

Another concern is that the approach may encourage the development of links with obvious weaknesses for the purpose of comparatively enhancing the attributes of a more suitable link. A good example is the creation of link C-29 at the end of Route GN6 to establish the connection to the designated Newton Station. It runs essentially parallel to (and within 2000 feet of) link C-30 which is the link at the end of GN11 (preferred route) connecting to the designated Newton Station. The number of habitable structures on link C-29 is approximately 30. Whereas, the number of structures on the preferred route (link C-30) is approximately twelve. The two links are essentially the same length, (C-29 at 22,819 feet) (C-30 at 25,928 feet) and represent roughly the same physical characteristics. It would have made more sense methodologically to finish Route GN6 by using links C-28 and C-30 instead of creating a straw man that affected more than twice as many habitable structures, which speaks, again, to the over-reliance on habitable structures as a determining factor by PBS&J and LCRA TSC.

:

A third concern is related to the issue of fragmentation. Ostensibly, one of the purposes of a third-party environmental assessment is to identify and evaluate cumulative effects

associated with proposed alternatives for a given project. One of the more significant effects of constructing large scale linear structures such as electric transmission lines across rural settings is the fragmentation of habitat and land use. In many instances, the concomitant reduction in value for wildlife, and for a number of historically established human activities associated with economic and aesthetic uses of the land is potentially significant. With that in mind, however, the PBS&J E.A. reads more like a justification of a given decision than an assessment of discrete and cumulative effects and their potential to cause significant negative change in the human and natural environment.

Q. WITH REGARD TO THE VALUES ENTERED IN CELLS FOR EACH OF THE 38 CRITERIA, DO YOU CONCUR WITH WHAT PBS&J HAS PROVIDED IN TABLE 6.1 (REV.1)?

A. For the most part, they appear reasonable. As indicated above, however, I do have questions regarding habitable structures, and I have significant concerns regarding criteria No. 28, "Length of ROW across known habitat of federally endangered/threatened species", that shows entries of zero (0) for all of the proposed links in the route analysis. Although, I am not an expert on the determination of habitat for endangered/threatened species, I am required to be a reasonably informed consumer of that kind of information because I occasionally manage multidisciplinary teams that characterize the suitability of sites. An important legal and regulatory issue for selecting any site (linear or non-linear) for a use that substantially alters the natural

setting is the identification of habitat of listed species. All things considered, good practice typically indicates that areas with important habitat should be excluded from further consideration. Given the nature of the study area, the probability on the face of it, that all the links would have no habitat for listed species is close to zero (0). (I do have some expertise regarding inductive statistics.)

In fact, comments provided by Texas Parks & Wildlife (12/23/2009) to Mr. Brian Almon, P.E., Public Utilities Commission (pages 002 and 003), take issue with the PBS&J zero determination by stating that,

“TPWD is concerned that the TxNDD information has been misinterpreted and misused in Table 6-1 of the EA. As a result, real information on potential adverse impacts to species has not been evaluated as a constraint in the alternatives analysis and preferred route selection, nor are potential impacts addressed.”

In the subsequent comment TPWD summarizes the results of its analysis by stating:

“This information is not consistent with TXNDD information provided to PBS&J. TPWD review of the TXNDD indicates that TXNDD records for federally endangered species are present either directly on or within the action area of 8 of the 11 proposed alternative Routes, including preferred alternative GN11.” (emphasis added by TPWD)

The TPWD comment goes on to identify potential habitat for Black-capped Vireo, Bald Eagle, and Golden-cheeked Warbler for Route GN11.

Ultimately, TPWD indicates that Route GN6, "would have the least amount of adverse impact on biological resources, and substantially less than Route GN11." (TPWD Comment, page 008, 12/23/2009)

Q. OTHER THAN THE ENDANGERED/THREATENED SPECIES ISSUE, DO YOU HAVE ADDITIONAL OBSERVATIONS RELATED TO THE ECOLOGY CRITERIA?

A. Yes. If one moves the land use criterion of "length of right-of-way through rangeland/pasture" into the ecology subset to address TP&WD concerns about impacts on essentially undisturbed habitat, the differences between GN6 and GN11 are nominal. For example, Routes GN6 and GN11 pass through 78.07 and 83.43 miles of rangeland/pasture, respectively; 16.12 and 14.66 miles through upland woodlands, respectively; 1.4 and 1.84 miles through bottomland/riparian woodland, respectively; 0.23 and 0.11 miles across open water, respectively; cross streambeds 113 and 107 times, respectively; cross river channels 3 and 4 times, respectively; run parallel within 100 feet to streams and rivers for 2.82 and 2.63 miles, respectively; and run across 100 year floodplains for a distance of 6.12 and 5.70 miles, respectively. (PBS&J Table 6-1 rev.1) Declaring one route superior to the other based on a comparison of the differences in these criteria amounts to an exercise in false precision.

Q. WITH REGARD TO POTENTIAL IMPACTS ON CULTURAL RESOURCES, HOW WOULD YOU EVALAUATE THE ATTRIBUTES OF GN6 AND GN11 USING THE PBS&J CRITERIA?

A. Two of the five PBS&J cultural resource criteria represent significant statutory and regulatory parameters. Criteria No. 34, "number of recorded historic or pre-historic sites crossed" and No. 36, "number of national register listed/eligible sites crossed," have measurable impact on the suitability of the proposed routes. Of the two criteria, No. 36 (national register sites) represents a higher order of concern, given the potential value of information contained at unique and/or higher quality sites. Proposed right-of-way for GN6 and GN11 each cross one (1) national register listed/eligible site. With regard to criterion No. 34, GN6 crosses 21 recorded historic or pre-historic sites, and GN11 crosses nineteen (19) sites.

PBS&J uses two related criteria that are extensions of No. 34 and No. 36, in that sites within 1,000 feet of the right-of-way are identified. According to PBS&J, there are twenty-two (22) additional recorded historic or pre-historic sites within the 1,000 foot buffer zone of Route GN6. There are nine (9) additional sites identified within 1,000 feet of the GN11 right-of-way. There are zero (0) additional national register listed/eligible sites identified within the 1,000 foot buffer zones of either GN6 or GN11.

Given the fact that none of the recorded historic/prehistoric sites within the 1,000 foot buffer zones of either GN6 or GN11, respectively, have been nominated to the national register significantly reduces their relative importance for this analysis. Moreover, depending on their spatial distribution within the buffer zones over the respective distances of 84.69 and 85.47 miles of right-of-way (for GN6 and GN11) avoidance or mitigation is probably achievable without significantly taxing the resources of the LCRA TSC.

The last cultural resources issue in the set, "length of right-of-way through areas of high archaeological/historical site potential," is an entropy rich variable that suggests large confidence intervals in its interpretation. In other words, predictive models are vulnerable to the assumptions used to bound possible outcomes; and outputs have limited validity unless there is strict adherence to meeting data quality objectives for input variables. For example, the locations of recorded sites in a given study area may correlate with terraces that are relatively close to seeps, springs, streams and rivers. Unless they are constrained by other information (population density or mobility) the models lend to predict similar site densities and locations, i.e. on terraces near fresh water.

Q. IN LAYMAN'S TERMS, ARE YOU SAYING THIS DATA IS "FUZZY"?

A. Yes, you can.

PBS&J suggests that the hypothetical distances for criterion number 38 on GN6 and GN11 are 74.40 and 69.70 miles, respectively. Given the inductive nature of the

exercise that produced these numbers, 74.40 and 69.70 miles represent either a dead-heat, or not, or maybe not, but without more empirical field work, there really is no way to know. Moreover, the lengths estimated for this variable for both routes consume nearly the entire distances from Gillespie to Newton.

From a purely practical cultural resources management perspective, neither route emerges as a clear-cut winner or loser in this category.

Q. DID YOU LOOK AT COST DATA FOR GN6 AND GN11?

A. Yes. The estimated costs for GN6 and GN11 are approximately \$161.5 million, and approximately \$161.9 million, respectively. Given contingencies from unanticipated changes in field conditions, it is not unreasonable to assume that the costs would remain comparable. Not unlike the ecology criteria, with the notable exception of data misused or misapplied in the case of endangered/threatened species, cost data for the two routes is not a useful discriminator.

IV. CONCLUSIONS

**Q. WHAT CONCLUSIONS CAN YOU DRAW FROM YOUR REVIEW OF THE PBS&J
E.A. AND ITS RECOMMENDATION OF GN11 AS THE PREFERRED ROUTE?**

A. GN11 is probably not the most suitable route. It does not conform to agency requirements to optimize the documented availability of existing right-of-way, parallel right-of-way for existing transmission lines, and parallel right-of-way for compatible land

uses or property lines. The apparent rationale for selecting GN11 was tied to the number of habitable structures that would be affected.

Ironically, what appears to be the most suitable route, GN6, was not selected because it appears to affect a disproportionately large number of habitable structures. The irony is embedded in the fact that of the 163 habitable structures identified by PBS&J as affected by the new route, 113 are situated on existing right-of-way which constitutes 78 percent of the total route for GN6. They are already affected even if the decision to use GN11 is upheld. By placing undue weight on habitable structures that are already affected by existing right-of-way, PBS&J skewed the analysis in favor of a route (GN11) that (according to the TP&WD) will have a significant impact on endangered/threatened species. GN11 creates approximately 46 miles of "new right-of-way" through essentially undisturbed habitat. One of the most interesting aspects of the comments by TP&WD is that PBS&J failed to identify any habitat for endangered/threatened species on any of the routes analyzed in the E.A.

Finally, the PBS&J E.A. fails to systematically address the cumulative effects of fragmentation of habitat and historically established land uses that result from the implementation of the preferred alternative. In fact, the E.A. does not address the issue of fragmentation at all.

V. RECOMMENDATIONS

Q. WHAT RECOMMENDATIONS DO YOU HAVE?

A. Based on the observations made in this evaluation of the PBS&J E.A., the most appropriate course of action appears to be the following:

- Reject GN11 as the preferred alternative.
- Modify GN6 by replacing link C-29 with C-30 to connect to the designated Newton Substation. That will reduce the number of newly affected habitable structures on GN6.
- Designate GN6 as the preferred route.

Mark Turnbough, PhD

**Environmental Consulting/Permitting
Compliance Management
and
Systems Analysis**

January, 2010

SUMMMARY OF QUALIFICATIONS

INTRODUCTION

Mark Turnbough has provided technical/regulatory consulting and work product on several multi-disciplinary site selection, characterization, environmental assessment and permitting projects.

Those projects range from controversial, high-visibility, large-scale water resource development and management programs along the U.S./Mexico boundary in El Paso, Starr, Willacy and Hidalgo Counties to the permitting and licensing of critical environmental facilities, e.g. nuclear power plants (HL&P South Texas Project and Texas Utilities Comanche Peak), major transmission line rights of way (ROW), hazardous/infectious waste treatment systems, waste disposal facilities, experimental energy storage systems at White Sands Missile Range, RCRA consulting to the U.S. Department of Energy (DOE) WIPP facility near Carlsbad, New Mexico, the settlement of a large and complex compliance order between Los Alamos National Laboratory and the State of New Mexico, and oversight (for DOE and WTS) of negotiations between the U.S. Department of Energy, the State of New Mexico and several advocacy groups expressing concern over the DOE proposal to bring remote handled mixed Transuranic Waste to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M.

In addition he has served as a volunteer advisor to state government. For example, in late 2002 and early 2003 he served as Chairman (Tri-Chair) of New Mexico Governor Bill Richardson's Transition Team for the New Mexico Environment Department (NMED).

During most of 2004 and early 2005 he served as a member of the NMED Environmental Justice Planning Committee. During the first four months of 2006, he worked on sub-committees with NMED staff and other interested parties in an attempt to reach consensus on provisions of the New Mexico Solid Waste Plan and the Solid Waste Management Regulations. In May of 2006, he provided technical support and draft language to the New Mexico Environmental Improvement Board regarding the addition of environmental justice parameters to the New Mexico Solid Waste Management Regulations, 20.9.1 NMAC. Currently, he is providing input to the NMED Draft Dairy Regulation Advisory Committee.

EDUCATION

PhD Texas Tech University, 1985

Major Fields: Systems Theory, Quantitative Analysis, Environmental Policy

M.A. Texas Tech University, 1971

Major Fields: Anthropology, Quantitative Sociology, Public Policy Analysis

B.A. Texas Tech University, 1969

Major Fields: Anthropology, Biology, Journalism

SELECTED PROJECT SUMMARIES

In 1987 he managed the third party environmental assessment that was used by the U.S. Bureau of Reclamation to assess the re-assignment of agricultural water rights in the Rio Grande Valley of El Paso County, Texas to municipal and industrial uses. The model he developed for making water resource re-allocation decisions in El Paso County (USBR Rio Grande Project) was subsequently utilized to provide a basis for converting agricultural water diversions in the Lower Rio Grande Valley (south Texas). The value of the approach is that it eliminates the need for lengthy and expensive Environmental Impact Statements (EIS) to re-distribute water appropriations within existing water projects. Ultimately, Mr. Turnbough was asked to describe the approach to the Committee on Energy and Natural Resources of the United States Senate (May 10, 1994).

During the same general time frame (1986 to 1994) he prepared the initial environmental information documents required for the opening of the Santa Teresa International Border Crossing (New Mexico / Mexico). Concurrently, he worked with the owners (Charlie Crowder and Tim Lewis) to master plan the original Santa Teresa industrial and residential complex (26,000 acres).

On behalf of El Paso and Hudspeth Counties, from 1988 to 1991 he recruited and managed a technical team of nationally recognized experts to evaluate the proposed Texas Low Level Radioactive Waste Disposal site at Ft Hancock, Texas. The results of that evaluation were used in District Court to prevent the state of Texas from designating an unsuitable site.

In 1997 and 1998 Mr. Turnbough provided consulting expertise to Phillips Petroleum Company in federal litigation regarding pipeline leaks near Borger, Texas. Phillips was able to negotiate mutually acceptable settlements with neighboring landowners.

Also in 1997 and 1998, he provided expertise to the Richey Oil Company which was opposed to the development of a 27,000 acre sludge application project adjacent to the historic Eagle Mountain Ranch in Hudspeth County, Texas. The Texas Natural Resources Conservation Commission (later re-named Texas Commission on Environmental Quality) subsequently withdrew its prior approval of the project.

From 1992 to the present, Mr. Turnbough has coordinated the permitting and re-permitting of the controversial Camino Real Landfill in Sunland Park (the largest facility of its kind in New Mexico). Under Mr. Turnbough's guidance, Camino Real ultimately received the Solid Waste Association of North America (SWANA) Landfill Excellence Award for the best landfill in North America (1997).

From 1994 through 1999, Mr. Turnbough also coordinated the site selection, characterization, design, permitting, construction and regulatory compliance for two additional regional landfills in New Mexico; Sand Point (Carlsbad) and Lea County Regional Landfill. In the process of permitting the Lea County facility, Mr. Turnbough was able to secure a ground water monitoring exemption based on the geologic qualities of the site selected for Lea County. He also participated in the regulatory rehabilitation of the permit for Tri-Sect Landfill in Valencia County. Since 1991, Mr. Turnbough has participated in the permitting of over half of the total solid waste disposal capacity in the state of New Mexico.

From 1995 to 2000, Mr. Turnbough served as a regulatory and environmental consultant to the Waste Control Specialists facility in Andrews County, Texas. It was the first hazardous (RCRA)/toxic (TSCA) and radioactive waste management facility of its kind in the United States (permitted under post LDR regulations).

From 1999 to 2003 he was also a consultant for Chandler and Associates in the assessment of a large and complex set of oilfield contamination cases in Johnson and Lawrence Counties, Kentucky.

Intermittently, during the past ten years Mr. Turnbough has worked with the law firm of Kemp-Smith and its clients, e.g. (Hunt Development Corp.) as a water resource development consultant for projects in the El Paso, Texas/Santa Teresa, New Mexico region.

From September of 2000 to December 2001, he was retained as a consultant for Westinghouse and Westinghouse Safety Management Solutions (WSMS) to provide regulatory guidance to the U.S. Department of Energy (DOE) regarding the modification of the RCRA permit (issued by the state of New Mexico) under which the DOE Waste Isolation Pilot Plant (WIPP) operates.

During the same time frame, he was retained as a consultant to (CRI), an oilfield waste recycling and disposal facility. On behalf of CRI, Mr. Turnbough provided expert testimony and coordinated technical input in opposition to an established New Mexico Environment Department (NMED) policy regarding oilfield waste disposition. The NMED hearing officer ruled against the Department's policy position (the only instance of that ever happening in the history of NMED). Subsequently, he supported CRI efforts as an intervener in New Mexico Oil Conservation Division (OCD) proceedings regarding the Division's attempts to improperly permit solid waste disposal facilities in the CRI service area. Ultimately, his efforts lead to major regulatory changes in OCD regulations for permitting solid waste disposal facilities.

From February, 2000 to 2006, he was retained by Kemp Smith through Hicks & Co. to provide regulatory impact assessments (RIA) for the Edwards Aquifer Authority in San Antonio, Texas.

In August 2001, he was retained by Moncrief Oil Co. to provide specialized regulatory consulting regarding the disposition of large volumes (1500 tons per day) of molten sulfur generated by the Lost Cabin natural gas processing plant located in the Madden Field (Wind River Basin) of central Wyoming.

Beginning in January 2002, the work done under contract to WSMS was shifted to CTAC, the technical assistance arm of DOE at WIPP, and expanded to include selected regulatory issues associated with the U.S. EPA jurisdiction over WIPP. In 2004, this work continued under contract to Washington TRU Solutions which is now a subsidiary of URS.

In February 2002, he was retained by American 3CI, to do permitting and compliance work for infectious waste management facilities.

In September 2002, he was retained by Cogema, Inc. to conduct regulatory and technical feasibility studies for a range of North American projects.

In June 2003, he was retained by the New Mexico State Land Office to prepare policy guidelines for oil and gas leases/rights of way permits to enhance the protection of surface resources on land owned/managed by the State of New Mexico.

In July 2003, he was retained by Aquila/Canberra to produce specialized regulatory and policy analyses for ongoing North American projects.

In January 2004, he was retained by The National Enrichment Facility (LES) to assist in the acquisition of state permits for its proposed Eunice, New Mexico uranium enrichment facility.

In, April 2004, he was retained by Advanced Technologies and Laboratories, Inc. (ATL) in Germantown, Maryland to fill a request by U.S. Department of Energy Headquarters for nationally recognized expertise to work on selected RCRA compliance problems with state regulators in New Mexico, Washington, Idaho, Texas and Ohio.

In June 2004, he was retained to prepare the Siting and Land Use Component of the Sandoval County Landfill Application for a Solid Waste Permit under contract to Gordon Environmental, Bernalillo, New Mexico. The permit was approved without opposition in July of 2005.

In July 2004, he was retained by Carroll, Gross, Reeder & Drews, LLP to evaluate alternative electric transmission line routes in a contested case before the Texas Public Utility Commission in Austin, Texas.

Early in 2005 he provided quality assurance review of the Camino Real Landfill (CRLF) Title V Operating Permit renewal application. It was submitted to the NMED Air Quality Bureau on April 29, 2005.

From late 2005 through early 2007, he managed the data collection and development of the first Community Impact Assessments (CIA) conducted in New Mexico for the specific purpose of supporting documentation in a solid waste facility application. The CIAs were prepared as part of the re-permitting of CRLF in Sunland Park and Chaparral.

During the same time-frame he drafted sections in the CRLF permit application and provided quality assurance review of the entire submission. The application package was submitted to the NMED Solid Waste Bureau on March 6, 2006.

In January 2006, he was retained by Las Uvas Dairies (one of the largest family owned dairy operations in the United States) to provide site characterization and guidance regarding the completion of two discharge permits pending before the state of New Mexico.

In April 2006, he was retained by a private consortium representing Lea and Eddy Counties, N.M. to assist in the response to a DOE request for proposals to identify a suitable site for a proposed spent nuclear fuel recycling facility.

In May 2006, he and Gordon Environmental were retained by the City of Clayton, New Mexico find and permit a suitable site for a regional solid waste landfill for northeast New Mexico and northwest Texas.

In the fall of 2006 he was selected as Principal Site Investigator for the Eddy-Lea Energy Alliance/AREVA/Washington Group project to characterize a southeastern New Mexico site for co-location of the U.S. Department of Energy's proposed Global Nuclear Energy Partnership (GNEP) facilities. The 1000 acre site was characterized for suitability to support the construction and operation of the Consolidated Fuel Treatment Facility and the Advanced Burner Reactor.

In August of 2007 he was selected as Principal Investigator for the Lea County Economic Development Corporation initiative to characterize sites for location of a second uranium enrichment facility in Lea County.

In January 2008 he was retained by Los Alamos National Security (LANS) to provide regulatory and environmental expertise to LANS and the National Nuclear Security Administration regarding the implementation of the RCRA Order on Consent for the cleanup of Los Alamos National Laboratory.

In July 2009, he was retained by Hicks & Co. to evaluate alternative routes for a major electric transmission line that would run through Kimball County, Texas.

ECONOMIC DEVELOPMENT

He has coordinated the implementation of significant energy/environmental/economic development strategies. In 1999, for example, he coordinated the passage of a \$500,000,000.00 incentive package in the New Mexico Legislature to help recruit uranium enrichment industries to a site located in eastern Lea County, New Mexico. That legislative initiative created circumstances which ultimately led to the (unlikely) licensing, permitting and construction of the multi-billion dollar LES Uranium Enrichment Facility near Eunice, N.M.

SUMMARY

Essentially, Mr. Turnbough provides technical support, task definition, management, and regulatory/political interface for clients whose projects require multi-disciplinary expertise. The interface fills a gap for law firms and other clients with complex task requirements in that it provides technical support that ranges well beyond "traditional" engineering and planning functions.

RESUMÉ

MARK W. TURNBOUGH, PhD

January, 2010

General Background: Includes advanced multi-disciplinary education, training and experience in the analysis and synthesis of complex systems, environmental policy, technology assessment, statistical research, land-use analysis/socio-economics/demography, legislative analysis/bill drafting, drafting of regulatory language and preparation of complex permit applications for critical facilities.

Consulting Experience: Primary areas of activity include regulatory permitting/compliance monitoring, management of technical negotiations for legal/regulatory settlements, environmental impact assessment, site suitability analysis, site selection, site characterization, analysis of land uses, site remediation/restoration analysis, statistical research and computer applications, including Geographic Information Systems and Predictive Models.

Synopsis of Selected Consulting Activity (1984-2009):

(For complete work history, see Page 7, **Experience** section).

In July of 2009, was retained by Hicks & Co. to evaluate the environmental impacts of alternative routes for a Lower Colorado River Authority (LCRA) electric transmission line that would run from Dallas to Kendall County, Texas.

In August of 2008, was retained by Waste Connections, Inc. to characterize and acquire land from the New Mexico Commissioner of Public Lands that would be suitable for permitting under 20.9.1 NMAC for a Subtitle D solid waste disposal facility in Otero County, New Mexico.

In August of 2008, was retained by The Urlacher Group (Big Bear Disposal, Inc.) to site, characterize, permit and oversee construction of an Oilfield disposal system under Rule 36 of the Oil Conservation Commission Regulations.

In February of 2008, was retained by Project Enhancement Corporation (PEC) to provide regulatory expertise to the Environmental Management Division of DOE re: Cross-cutting issues with the potential to affect multiple sites in the complex.

In January 2008, was retained by Los Alamos National Security (LANS) to provide regulatory guidance to LANS and NNSA re: implementation of the Los Alamos RCRA Order on Consent signed by the state of New Mexico, DOE and LANS.

In December 2007, coordinated the legal/technical case and testified for the applicant in the New Mexico Environment Department's adjudicatory permit hearing for Camino Real Landfill in Sunland Park, New Mexico.

In August 2007, was retained by the Lea County Energy Committee / Lea County Economic Development Corporation to characterize the suitability of selected sites for construction and operation of a Uranium Enrichment Facility. International Isotopes has selected one of those sites for a deconversion plant.

In January 2007, was retained by the Eddy-Lea Energy Alliance, LLC (ELEA) as Principal Site Investigator for the proposed ELEA Global Nuclear Energy Partnership (GNEP) Site Characterization effort for a Consolidated Fuel Reprocessing Facility and a n Advanced Burner Reactor.

In December 2006, was retained by Sundance Oilfield Services, LLC to develop an application under new Oil Conservation Division regulations for solid waste disposal facilities near Eunice, New Mexico.

In October 2006, was retained by Ben Barnes & Associates to evaluate RCRA compliance issues for the Lea Land Industrial Waste Disposal Facility in Lea County, New Mexico.

In May 2006, was retained by the City of Clayton, New Mexico to locate, characterize, acquire and permit a suitable site for a regional landfill for northeast New Mexico and northwest Texas.

In April 2006, was retained by Gordon Environmental, Inc. for Southwest Landfill to evaluate the relationship between the existing facility and land uses in the surrounding area.

In April 2006, was retained by a private consortium representing Lea and Eddy Counties (ELEA), New Mexico to manage the preparation of a site proposal to the DOE (Global Nuclear Energy Partnership-GNEP) request for proposals to identify a suitable site for a proposed spent nuclear fuel recycling facility. After GNEP the ELEA has purchased the proposed site for other economic development purposes.

In January 2006, was retained as a consultant by Las Uvas Dairies (the largest family owned dairy company in the United States) to provide regulatory assistance to its facility engineers regarding the completion of a proposed consolidated discharge permit pending before the state of New Mexico.

From March 2005 to March 2006, drafted sections for the Camino Real Solid Waste permit application and provided quality assurance review of the entire submission. The application package was submitted to the New Mexico Environment Department Solid Waste Bureau on March 6, 2006.

From October 2005 to March 2006, coordinated independent third party preparation of Community

Impact Assessments (CIA) for Camino Real Landfill (Sunland Park, N.M.) and the proposed Rhino Landfill (Chaparral, N.M.). The studies were prepared as part of the permitting process for both facilities.

As consultant to Camino Real Landfill in Sunland Park, New Mexico, participated in the preparation and submission of the Title V Operating Permit renewal application. The application was submitted to the New Mexico Environment Department (NMED) on April 29, 2005 and was subsequently approved and the permit was re-issued.

As consultant to Sandoval County (New Mexico), participated in the preparation of a RCRA Subtitle D Application for a major expansion of regional landfill and recycling facility. (April 2004-June 2005). Facility permitted on July 17, 2005.

As consultant to Controlled Recovery, Inc. (CRI), provided regulatory expertise to large scale oil recycling operation in Lea County New Mexico (April, 2005-January 2007).

As consultant to WCI, Inc., negotiated settlement of NMED Administrative Order against El Paso Disposal, Inc. (a subsidiary of WCI, Inc.) (October-December, 2004).

As consultant to Carroll, Gross, Reeder & Drews, LLP provided expertise for the evaluation of electric transmission line routes in central Texas (July, 2004-July, 2005).

As consultant to CH2M HILL, provides specialized regulatory and project development expertise (August 2004-present).

As contractor to Advanced Technologies and Laboratories International, Inc. (ATL) provides specialized regulatory expertise to U. S. Department of Energy Headquarters Environmental Management Division (EM3) for the definition and resolution of major regulatory problems for DOE facilities, e.g. LANL Consent Order, Hanford TRU Tank Waste and Fernald Silos Waste (April 2004-2007).

As consultant to Washington TRU Solutions (WTS) provides specialized regulatory consulting for the Washington Group at the U.S. Department of Energy WIPP facility in the state of New Mexico (January 2004-present).

As consultant to the National Enrichment Facility (NEF), provides specialized regulatory consulting for the acquisition of environmental permits from the state of New Mexico (January 2004-present).

As consultant to Aquila / Canberra, Inc. provided specialized regulatory and policy analyses for ongoing North American projects (July 2003-2006).

As consultant to the New Mexico State Land Office provided policy guidance for enhancing the protection of surface resources on land owned by the State of New Mexico (June 2003-July 2004).

As consultant to Cogema (AREVA), Inc. conducted regulatory and technical feasibility studies for a range of potential North American projects (September 2002-2003).

As consultant to American 3CI, provided regulatory expertise on the preparation of permits for infectious waste management facilities (February 2002-March 2006).

As consultant to CTAC, provided regulatory expertise on the modification of the U.S. Department of Energy (DOE) /WIPP hazardous waste permit issued by the State of New Mexico (January 2002-January, 2004).

As consultant to Moncrief Oil Company, provided specialized regulatory guidance on the disposition of sulfur and related by-products of natural gas processing facilities in the Wind River Basin of central Wyoming (August 2001-August 2002).

As consultant to Westinghouse/TRU Solutions and Westinghouse Safety Management Solutions, provided regulatory expertise on the modification of the U.S. DOE/WIPP hazardous waste permit issued by the state of New Mexico (September 2000-December 2001).

As consultant to the Edwards Aquifer Authority (contracted through Kemp Smith, P.C. and Hicks and Co.) provides regulatory analysis for the development of and impact assessment for new aquifer management rules (June 2000-present).

As environmental consultant to CRI, Inc. provided regulatory expertise; client was in opposition to a proposal by the state of New Mexico to co-mingle oilfield wastes with solid waste (sub-title D) in disposal cells permitted for sub-title D wastes (Jan.-Nov., 2000). NMED hearing officer adopted Mr. Turnbough's interpretation of the regulatory framework. It was the first time an NMED hearing officer has ever ruled against an established NMED policy.

As consultant to the Washington Group assisted in the development of a community interface plan to improve the company's relationship with Lea County, New Mexico (July-September, 2000).

As consultant to the Washington Group, provided permit and license data regarding WCS capabilities to store and characterize TRU waste in support of the WIPP project (February- April, 2000).

As environmental consultant to Lea County, New Mexico provided interface with U.S. Department of Energy (DOE) in preliminary discussions regarding economic development associated with the operation of the DOE Waste Isolation Pilot Plant (WIPP) (1999-2000).

As environmental consultant to Raymond G. Sanchez and Robert Desiderio, attorneys at law, provided project management and coordination for site assessments on Maloof properties in New Mexico (January 2000-December 2001).

As environmental consultant to the El Paso, Texas based law firm of Kemp Smith, provided

expertise for the selection and development of water resources for use by the City of El Paso (2000-2005).

As environmental consultant to Chandler and Associates, provided expertise on the assessment of a large and complex oilfield contamination case in Johnson and Lawrence Counties, Kentucky (1999-2003).

As lead consultant on the Lea County Landfill project managed site selection studies and permit document preparation for submission to the New Mexico Environment Department (Permit granted 1999).

As environmental consultant to WCS, LLC Provided regulatory guidance for the development of permits and licenses for additional waste streams on the facility's New Mexico properties. Also provided systems support and compliance monitoring at permitted facility in Texas (June 1995-January 2000).

As environmental consultant to Harlan Richey (President of Richey Oil Co.), provided expertise and expert testimony; client was in opposition to a proposed 27,000 acre sludge application project adjacent to the historic Eagle Mountain Ranch in Hudspeth County, Texas. The Texas Natural Resources Conservation Commission (TNRCC) subsequently withdrew its prior approval of the project (1997-1998).

As environmental consultant to Phillips Petroleum, Inc., provided expertise and expert witness testimony (deposition only—case was settled in favor of Phillips) on a complex land use/groundwater contamination case (1997-1998).

As environmental consultant/project manager to Camino Real Environmental Center (CREC), managed the development of three solid waste permit applications for boundary modification, recycling center and landfill permit renewal for the solid waste facility at Sunland Park, (Doña Ana County) New Mexico. (Permits granted 1997). Coordinated Title V and NSPS permitting and related compliance issues at the all of the subsidiary facilities in New Mexico (1990-2006). Provides regulatory guidance for early phases of solid waste permit application preparation for 2007 hearing (2004-present).

As environmental consultant/project manager for USA/UNITED WASTE, coordinated the rehabilitation of a permit (solid waste) application for Tri-Sect Landfill in Valencia County, New Mexico. (1998)

As environmental consultant/project manager for CREC, managed the acquisition of a discharge permit for a sludge land application site at the CREC Sunland Park, New Mexico site. (1994)

As environmental consultant/project manager for CREC, managed the site selection and development of a permit application for the Eddy County, New Mexico regional landfill (Sand

Point Regional Landfill). (Permit granted 1994)

As environmental consultant/project manager for Med-Compliance Services (MCS), managed the development of a permit application for a bio-medical waste transfer and processing facility in Albuquerque (Bernalillo County) New Mexico. (Permit granted 1994).

Project required the development of a new processing technology that could meet new state standards.

As environmental consultant to Lower Valley Water District (El Paso County), prepared environmental assessments for Las Azaleas constructed wetlands project. (1993).

As permit consultant to R.R.I., acquired landfill and recycling permits for R.R.I. (NUMEX Landfill) facilities at Sunland Park, New Mexico. (1991).

As project manager for El Paso County, (El Paso County versus State of Texas), coordinated 4 year review of Ft. Hancock site suitability for radioactive waste disposal. Developed technical case for plaintiffs. Plaintiffs prevailed on all 25 factual issues. District court decision upheld plaintiffs. State did not appeal. (1988-1991).

As Director of Special Projects (consulting position) at the Rio Grande Council of Governments, El Paso, Texas responsibilities included development and management of multi-disciplinary projects that focused primarily on land use and site planning issues in the region, e.g., site selection for landfills, industrial parks, experimental energy storage systems, etc., (1989).

As Principal Planner at Sub-Land, Inc. El Paso, Texas responsibilities included management of environmental and economic feasibility studies for large-scale land use projects. (1986-1987).

As a Senior Staff Policy Analyst/Planner at EH & A Environmental Consultants, Austin, Texas was responsible for the design and implementation of land use, environmental/economic baseline and impact studies and other assessments. Also was responsible for various types of specialized studies (regulatory, budgeting and forecasting). Developed and managed computer-based models for environmental planning, e.g. riverine flow impacts on bays and estuaries, predictive models for archeological resources in large scale surveys. (1984-1987).

Expert Witness Experience: Federal and State Court; Regulatory Hearings. (Primary areas – permitting, environmental assessment, environmental remediation/restoration, land use analysis, solid waste facility regulations, municipal services assessment and redistricting). Expert testimony in Administrative/Regulatory Hearings on environmental/land use issues, e.g. RCRA permits, air quality permits, routing of electric transmission lines and water plans.

Academic Experience: Taught courses in site planning, land use management, environmental policy, alternative energy resource investigations, organization theory, industrial expansion analysis, policy typology assessment, public budgeting fiscal planning, anthropology and quantitative sociology.

Experience/Work History:

(Note: Several activities have overlapping/ concurring time frames)

Environmental Consultant:

Hicks & Co.
Austin, Texas
July 2009

**Land Acquisition/
Permitting Consultant:**

Waste Connections, Inc.
Folsom, California
August 2008 to the present

Permitting Consultant:

The Urlacher Group
Chicago, Ill
August 2008 to the present

Regulatory Consultant:

Project Enhancement Consultants
Germantown, Maryland
February 2008 to the present

Regulatory Consultant:

Los Alamos National Security, LLC
Los Alamos National Laboratory
January 2008 to the present

Project Manager:

Waste Connections, Inc. Folsom, CA
Adjudicatory Permit Hearing for Camino
Real Landfill (Sunland Park, NM)
December 2007 (30 day hearing)

Site Suitability Consultant:

Lea County, New Mexico
Uranium Enrichment Facility Sites
Hobbs, New Mexico
August 2007 to the present

Principal Site Investigator:

Eddy-Lea Energy Alliance,
Global Nuclear Energy Partnership
Site Characterization for Spent Fuel
Reprocessing Facility and ARR
January 2007-present

Permitting Consultant:

Sundance Oilfield Services,
Eunice, New Mexico
December 2006-present

Regulatory Consultant:

Ben Barnes & Associates,
Austin, Texas
October 2006-present

Land Use/ Regulatory Consultant:

City of Clayton, New Mexico
May 2006-present

Land Use Consultant:

Lea/Eddy County GNEP Proposal
Hobbs/Carlsbad, New Mexico,
April 2006-present

Land Use Consultant:

Southwest Landfill
Albuquerque, New Mexico
February, 2006-present

Regulatory Consultant:

Las Uvas Dairies
Hatch, New Mexico
January 2006-present

Land Use Consultant:

Carroll, Gross, Reeder & Drews, L.L.P.
Austin, Texas, July 2004-July 2005

Systems and Environmental Consultant:	CH2M Hill, Inc., Albuquerque, New Mexico August 2004-present
Regulatory Consultant:	Advanced Technologies and Laboratories, International, Inc. Germantown, Maryland, April 2004-2007
Regulatory Consultant:	Washington TRU Solutions Carlsbad, New Mexico U. S. Dept of Energy WIPP Facility January 2004-present
Regulatory Consultant:	National Enrichment Facility Albuquerque, New Mexico January, 2004 - present
Policy Consultant:	Aquila/Canberra, Inc. Albuquerque, New Mexico July, 2003 - 2006
Land Use Consultant:	New Mexico State Land Office Santa Fe, New Mexico June 2003- July 2005
Regulatory Consultant:	Cogema, Inc. Bethesda, Maryland August, 2002 - 2003
Regulatory Impact Consultant:	Hicks & Co. Austin, Texas January, 2002-present
Regulatory Consultant:	American 3CI Dallas, Texas February 2002-March 2004
Regulatory Consultant:	CTAC Carlsbad, New Mexico U.S. DOE/WIPP Site January 2002-2003

Regulatory Consultant:	Moncrief Oil Company Fort Worth, Texas Wind River Basin Wyoming August 2001-2003
Regulatory Impact Consultant:	Edwards Aquifer Authority San Antonio, Texas June 2000-present
RCRA Permit Consultant: (Sub-title C)	Westinghouse / U.S. Dept. of Energy WIPP Facility Carlsbad, New Mexico September 2000-December 2001
Expert Witness (remediation):	Bramblett & Bramblett El Paso Texas 2000-2001
Environmental Consultant: (Regulatory Compliance)	CRI, Inc. Hobbs, New Mexico January 2000-2006
Environmental Consultant: (Site Assessment)	Raymond G. Sanchez and Bob Desiderio Attorneys at Law Albuquerque, New Mexico February, 2000-February 2001
Environmental Consultant: (Water Development Strategy)	Kemp- Smith Law Firm El Paso, Texas February, 2000-2006
Environmental Consultant: (DOE Policy)	Lea County, New Mexico 1999- April 2000
Environmental Consultant: (Oilfield Contamination Assessment-Expert Witness)	Chandler and Associates, Lufkin, Tx Spivey & Ainsworth, Austin, Tx In Re: Martha Oilfield (Paintsville, Kentucky) July, 1998-present
Environmental Consultant: (Oilfield Contamination Assessment- Expert Witness)	Phillips Petroleum Borger Refinery (Tx) Bartlesville, Oklahoma 1997-1998

**Environmental Consultant:
(Surface Water Protection-
Expert Witness)**

Richey Oil Company
Tyler, Texas
(Project located in Hudspeth Co. Texas)
1997-1998.

**Environmental Consultant:
(Remediation Estimates-
Expert Witness)**

"Triangl" (sic) Equities
El Paso, Texas
1997-1998

**Environmental Consultant:
(RCRA/RAD Regulation)**

Waste Control Specialists, LLC.
Pasadena, Texas 1995-2000

**Environmental Consultant:
(Land Use Analysis)**

Santa Teresa Development, Inc.
February, 1986 to 1994

**Environmental Consultant:
(Landfill Evaluation)**

El Paso County Commissioner's Court
El Paso, Texas
1989 to 1991

**Environmental Permit Consultant:

(Landfill Site Selection, Permitting)**

R.R.I. (Waste Disposal)
El Paso, Texas
June 1990-present
(Purchased in 1999 by Waste Connections,
Inc.)

**Biomedical Waste Technology Development:
(Regulatory Consultant)**

Med-Compliance Services
El Paso, Texas
February, 1991-1999

**Environmental Consultant:
(Land Use)**

Horizon Environmental Services
Austin, Texas
1995-1996

Director, Environmental Projects:

Rio Grande Council of Governments
El Paso, Texas
March 1987-July, 1989

**Instructor:
(Adjunct)**

New Mexico State University
Land Use Analysis
Las Cruces, New Mexico
1988

Principal Planner

Sub-Land, Inc.
El Paso, Texas
1986-1987

**Senior Policy Analyst / Land
Use Analyst:**

Espey, Huston & Associates, Inc.
Austin, Texas
1984-1986

**Division Chairman:
(Interim)**

Social Sciences
Wayland University
Plainview, Texas
1983

**Lecturer - Budgeting and
Forecasting:**

MPA Program, Texas Tech University
Lubbock, Texas
1983

Research Associate:

Center for Energy Research
Texas Tech University
Lubbock, Texas 1979

Lecturer - Technology Assessment:

Department of Industrial and
Systems Engineering (Doctoral Program)
Texas Tech University
Lubbock, Texas
1979

Assistant Division Chairman:

Public Administration/Systems
Wayland University
Plainview, Texas
1978-1983

**Administrative Head/Interim
Director:**

Computer Services
Wayland College
Plainview, Texas
1976-1978

Instructor - Public Policy:

Department of Political Science
Texas Tech University
Lubbock, Texas
1976

Assistant to City Manager:

City of Plainview, Texas
1976

**Research Assistant, Stochastic
Models:**

Frederick Hartmann, Alfred
Thayer Mahan Professor of
Maritime Strategy
Naval War College
1975

**Instructor- Department of
Anthropology/Sociology:**

Department of Anthropology/Sociology
Wayland College
Plainview, Texas
1971-1974

Research Assistant:

Department of Anthropology/Sociology
Texas Tech University
Lubbock, Texas
1970-1971

Technical Writer:

Litton Industries
Lubbock, Texas
1969

Education: (Major Fields)

PhD:

Systems Theory and Environmental Policy
Dissertation Topic – Typological Constructs
(Environmental Policy Issue—Environmental Resources Management)
Texas Tech University
Lubbock, Texas
August, 1985

MA:

Anthropology/ Sociology/ Public Policy Analysis
Thesis Topic – Ideal Typology Development
Texas Tech University

Lubbock, Texas
1971

BA: Anthropology / Biology / Journalism
Texas Tech University
Lubbock, Texas
1969

Advisory Committees:

New Mexico Environment Department, Draft Dairy Regulation Advisory Committee, June 2009 to present.

New Mexico Environment Department, Environmental Justice Planning Committee, December, 2003 to 2006.

New Mexico Governor-Elect Bill Richardson Transition Team Chairman (Tri-Chair) for the New Mexico Environment Department, November 14, 2002 to January 31, 2003.

New Mexico Environment Department Radioactive Materials Fees Advisory Committee (Waste Management and Disposal Industry Representative), May 1, 2000 to December 31, 2003.

USEPA Environmental Justice Advisory Council/ SWANA-- Waste Transfer Station Working Group, 1999 to May, 2001

New Mexico Environment Department, Tire Recycling Advisory Committee, 1995-1996

New Mexico Environment Department, Solid Waste Regulations Revision Advisory Committee, August - December, 1993

Rio Grande Council of Governments, Regional Solid Waste Management Plan (Far West Texas Planning Region), 1993

El Paso City/County Consolidated Data Processing Advisory Board - Oversight of computer operations for consolidated system, 1989 - 1991

Awards:

Solid Waste Association of North America (SWANA) Landfill Excellence Award for Best Landfill Operation in North America, 1997 (Coordinated effort for facility operation and evaluation).

Outstanding Contribution Award - Environmental Design Contest, Waste Education Research Consortium, (Los Alamos National Laboratory, Sandia National Laboratory, University of New Mexico, New Mexico Tech, New Mexico State University and U.S. Department of Energy) May, 1993.

Outstanding Graduate Student Teacher of the Year, Texas Tech University, 1976.

George Mahon Congressional Scholarship Award for Graduate Study of Public Policy, 1974-1975.

Joint Graduate Student/Graduate Faculty Research Grant, "Development of Disaggregative Analysis for Decomposition of Large Data Sets", Texas Tech University, 1974.

Technical Reports/Papers/ Pre-Filed Direct Testimony and Related Documents:

Note: All of the Espey-Huston (EH&A) reports and all of the regulatory assessments prepared for the Edwards Aquifer Authority were prepared in collaboration with multi-disciplinary teams of experts.

"Volume IV: Siting and Land Use" IN THE MATTER OF THE APPLICATION OF CAMINO REAL ENVIRONMENTAL, INC. FOR A SOLID WASTE FACILITY PERMIT FOR THE CAMINO REAL LANDFILL, prepared for WCI, Inc. Folsom, California, March 2006.

"Rhino Landfill Status: Comprehensive Report to Otero County Commissioners," presented on behalf of WCI, Inc., Folsom, California, November 2, 2005.

"Summary and Evaluation of New Mexico Oil Conservation Division Process and Procedure Under OCD Rule 711(B) In Re: Proposed Permits for Solid Waste Disposal for Artesia Aeration and Gandy Marley, Inc., prepared for CRI, Inc. Hobbs, New Mexico, June, 2005.

"Proposed Findings of Fact" In Re: THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING THE APPLICATION OF GANDY MARLEY, INC. TO MODIFY NMOC D PERMIT NO.NM- 01-019... Case No. 13,480, prepared for CRI, Inc. Hobbs, New Mexico, submitted to OCD June 24, 2005.

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; P.U.C. DOCKET NO. 29684, Expert Testimony presented in HEARING ON THE PROPOSED ALTERNATIVE FOR THE HILL COUNTRY PROJECT, June 27- July 2, 2005.

In Re: APPLICATIONS OF SANDOVAL COUNTY TO EXTEND AND MODIFY SOLID WASTE PERMITS FOR THE SANDOVAL COUNTY REGIONAL LANDFILL BEFORE THE NEW MEXICO ENVIRONMENT DEPARTMENT, Expert Testimony presented on Land Use and

Site Suitability Criteria presented on May 11, 2005. (Permits Granted by NMED on June 17, 2005).

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; PUC DOCKET NO. 29684, Expert Testimony pre-filed on December 8, 2004, Austin, Texas.

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; PUC DOCKET NO. 29684, Expert Testimony presented in HEARING ON ADEQUACY OF ROUTES, November 10, 2004, Austin, Texas.

“Siting and Land Use; Volume IV, Sandoval County Landfill Application,” prepared for Sandoval County, New Mexico under contract to Gordon Environmental, Albuquerque, New Mexico, July, 2004.

“Regulatory Impact Assessment for Proposed Amendments to Rule 711 (Groundwater Withdrawals), Subchapters E (Groundwater Withdrawal Permits), F (Standard Groundwater Withdrawal Conditions), G (Groundwater Available for Permitting; Proportional Adjustment; Equal Percentage Reduction), L (Transfers), and M (Meters; Alternative Measuring Methods; and Reporting): Rule 715 (Comprehensive Water Management Plan Implementation), Subchapters A (Definitions) and D (Demand Management and Critical Period Management Rules): Rule 702 (General Definitions): Rule 709 (Fees), Subchapter D (Aquifer Management Fees)” prepared for the Edwards Aquifer Authority under contract to Hicks and Co./ Kemp Smith, P.C., San Antonio, Texas, July 2004.

“New Mexico Environment Department: Transition Task Force—Follow-Up Analysis of NMED Issues Raised in December 2002 Transition Team Report” prepared for the New Mexico Governor’s Office, Santa Fe, New Mexico, December 9, 2003.

“Regulatory Impact Assessment for Proposed Rules Chapter 711 (Groundwater Withdrawal Permits) Subchapters E (Groundwater Withdrawal Permits), G (Groundwater Available for Permitting; Proportional Adjustment; Equal Percentage Reduction) and K (Additional Groundwater Supplies)” prepared for the Edwards Aquifer Authority under contract to Hicks & Co./ Kemp Smith, P.C., San Antonio, Texas, November 2003.

“Draft Surface Resource Protection Guidelines for Oil and Gas Operations on New Mexico State Trust Lands” prepared for the New Mexico State Land Office, Santa Fe, New Mexico, October, 2003.

“Regulatory Impact Assessment for Proposed Rules Chapter 715 (Comprehensive Water Management Plan Implementation Rules) Subchapters A (Definitions), B (Variance Procedures) and

C (Groundwater Conservation and Reuse Rules) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./ Kemp Smith, P.C., San Antonio, Texas, July, 2003.

"New Mexico Environment Department: Transition Task Force Report" prepared for the Hon. Bill Richardson, Governor-Elect, State of New Mexico, Santa Fe, New Mexico, December, 2002.

"Regulatory Impact Assessment for Proposed Rule Chapter 711 (Groundwater Withdrawal Permits) Subchapter J (Aquifer Recharge, Storage and Recovery Projects) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, September, 2002.

"Regulatory Impact Assessment of Alternative Proposed Rule 715 (Comprehensive Water Management Plan Implementation Rules) Subchapter A (Definitions) and D (Demand Management and Critical Period Management Rules) [15 Percent Reduction in Stage IV Critical Period Management Groundwater Withdrawals] prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, September, 2002.

"Regulatory Impact Assessment for Proposed Rule Chapter 713 (Water Quality) Subchapters A (Definitions), B (General Provisions), C (Well Construction, Operation and Maintenance) and D (Abandoned Wells; Well Closures) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, August, 2002.

"Regulatory Impact Assessment for Proposed Rule Chapter 715 (Comprehensive Water Management Plan Implementation Rules) Subchapters A (Definitions) and D (Demand Management and Critical Period Management Rules) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, July, 2002.

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