

#,/ * +) & 1 # * , % # , % & 6 6 * + - & , 6 (% G # 1 " % 1 " (% ; &) # 8 9 % P - . 6 & 1 # * , & 8 % > # 2 " 1 \$ % & , - %
V + # 7 & 6 9 % E 6 1 % * / % F W X Y I % & \$ % &) (, - (- C % O * G (7 (+ I % 1 " (% ; & 6 # 8 # 1 9 % " (+ (A 9 % & 8
1 * % H ((3 % 6 * , / # - (, 1 # & 8 % & , 9 % \$ 1 - (, 1 % + % 6 # , # * \$) & 1 # * , % # 1 %) & 9 % * A 1 & # , I %
 , 8 (\$ \$ % # 1 % " & \$ % * 1 " (+ G # \$ (% * A 1 & # , (- % 3 + # * + % G + # 1 1 (, % 6 * , \$ (, 1 % * / % 1 " (% \$ 1 - (,
E 8 1 " * . 2 " % 1 " (% B , \$ 1 # 1 . 1 # * , % \$ " & 8 8 % * A 1 & # , % & 8 8 % + (J . # + (- % 6 * , \$ (, 1 \$ I % 1 " (% ; & 6
\$ " & 8 8 % " & 7 (% 1 " (% + # 2 " 1 % 1 * % + (8 9 % * , % \$. 6 " % 6 * , \$ (, 1 \$ % & , - % 1 * % * A 1 & # , % 6 * 3 #
\$. 6 " % 6 * , \$ (, 1 \$ % . 3 * , % + (J . (\$ 1 C % ! " (% ; & 6 # 8 # 1 9 % G # 8 8 % & \$ \$ # 2 , % & % \$ 1 & / / %
+ (3 + (\$ (, 1 & 1 # 7 (% & \$ % 8 # & # \$ * , % A (1 G ((, % 1 " (% ; & 6 # 8 # 1 9 % & , - % 1 " (% B , \$ 1 # 1 . 1 # * , C
 ; & 6 # 8 # 1 9 % \$ 1 & / / % + (3 + (\$ (, 1 & 1 # 7 (%) & 9 % A (- (\$ 2 , & 1 (- % # , % 1 " (% E 2 + () (, 1 C %
O , 8 (\$ \$ % * 1 " (+ G # \$ (% \$ 3 (6 # / # (- % # , % 1 " (% E 2 + () (, 1 I % & , 9 % (7 & 8 . & 1 # * , % * / %
\$ 1 - (, 1 \$ % A 9 % 1 " (% ; & 6 # 8 # 1 9 % \$ " & 8 8 % + (8 & 1 (% * , 8 9 % 1 * % 2 (, (+ & 8 % \$ 1 - (, 1 %
3 & + 1 # 6 # 3 & 1 # * , % # , % 1 " (% E C Q C P C I % & , - % \$ " & 8 8 % # , % , * % G & 9 % A (% 6 * , \$ 1 + . (- % &
6 (+ 1 # / # 6 & 1 # * , % A 9 % 1 " (% ; & 6 # 8 # 1 9 % & \$ % 1 * % 1 " (% 6 *) 3 (1 (, 6 (% * / % & , 9 % \$ 1 - (, 1
+ (3 + (\$ (, 1 & 1 # * , % A 9 % 1 " (% ; & 6 # 8 # 1 9 % * / % & , 9 % \$ 1 - (, 1 \$ % & A # 8 # 1 9 % * + % 6 *
, % 6 * , (6 1 # * , % G # 1 " % 1 " (% 3 + & 6 1 # 6 & 8 #) 3 8 () , 1 & 1 # * , % * / % & , 9 % H , * G 8 (- 2 (%
2 & # , (- % 1 " + * . 2 " % 1 " (% E C Q C P C %
%

Y C ! " (% ; & 6 # 8 # 1 9 % \$ " & 8 8 % 3 + * 7 # - (% / * + % 1 " (% * + # (, 1 & 1 # * , % * / % A * 1 " % B , \$ 1 # 1 . 1 # * , ;
& , - % 3 & + 1 # 6 # 3 & 1 # , 2 % \$ 1 - (, 1 \$ % & \$ % 1 * % 1 " (% 3 " # 8 * \$ * 3 " # (\$ I % + . 8 (\$ I % + (2 . 8 & 1 #
& , - % 3 * 8 # (\$ % * / % 1 " (% ; & 6 # 8 # 1 9 C %
%

Z C ? . A D (6 1 % 1 * % 1 " (% ; & 6 # 8 # 1 9 L \$ % * 7 (+ & 8 8 % \$. 3 (+ 7 # \$ * + 9 % + (\$ 3 * , \$ # A # 8 # 1 9 % / *
6 & + (I % & 3 3 + * 3 + # & 1 (8 9 % 8 # 6 (, \$ (- % B , \$ 1 # 1 . 1 # * , % / & 6 . 8 1 9 %) () A (+ \$ %) & 9 % 3 + *
\$. 6 " % 3 & 1 # (, 1 % \$ (+ 7 # 6 (\$ % & 1 % 1 " (% ; & 6 # 8 # 1 9 % & \$ %) & 9 % A (% , (6 (\$ \$ & + 9 % / * + %
3 . + 3 * \$ (\$ C % ! " (% , & 1 % & , - % 6 * 3 (% * / % & 6 1 # 7 # 1 # (\$ % * / % B , \$ 1 # 1 . 1 # * , % / & 6 . 8 1 9 %
) () A (+ \$ % 1 " & 1 %) & 9 % # , 7 * 8 7 (% # , % & , 9 % G & 9 % 3 & 1 # (, 1 % 6 & + (% & 1 % 1 " (% ; & 6 # 8 # 1
A (% \$. A D (6 1 % 1 * % 1 " (% \$ * 8 (% - # \$ 6 + (1 # * , % * / % 1 " (% ; & 6 # 8 # 1 9 % & , - % 1 * % \$. 6 " % 6 * ,
& \$ % 1 " (% ; & 6 # 8 # 1 9 %) & 9 % - (() , (6 (\$ \$ & + 9 % # , % # 1 \$ % \$ * 8 (2 1 % A 1 % (1 # * , % # , 6 8
 , * 1 % 8 #) # 1 (- % 1 * I % 3 + # * + % 3 + * * / % * / % 3 + * / (\$ \$ # * , & 8 % 8 # & A # 8 # 1 9 % 6 * 7 (+ & 2 (I 9
& 3 3 + * 3 + # & 1 (% 8 # 6 (, \$. + (% * + % 6 (+ 1 # / # 6 & 1 # * , I % & , - % 6 *) 3 8 # & , 6 (% G # 1 " % & 8 8 %
+ . 8 (\$ I % + (2 . 8 & 1 # * , \$ I % & , - % 3 * 8 # 6 # (\$ C % B / % / & 6 . 8 1 9 % 3 & + 1 # 6 # 3 & 1 # * , % & 1 % 1
* 1 " (+ % 1 " & , % & \$ % & % ? . 3 (+ 7 # \$ (% 3 . 4 * 3 * \$ I % * / % 1 " # % E C Q C P C % # \$ % \$ % *
& . 1 " * + # [(- I % # 1 %) . \$ 1 % , * 1 % A (% & % \$. A \$ 1 # 1 . 1 (% / * + % & - (J . & 1 (% \$ 1 & / / # , 2 % & 1 % 1 "
 ; & 6 # 8 # 1 9 C %
%

\ C E 8 8 %) (- # 6 & 8 % * + % " (& 8 1 " % 6 & + (% 5 () + 2 (, 6 9 % * + % * 1 " (+ G # \$ (< % 1 " & 1 % & , %
B , \$ 1 # 1 . 1 # * , % \$ 1 - (, 1 % * + % / & 6 . 8 1 9 %) () A (+ % + (6 (# 7 (\$ % & 1 % 1 " (% ; & 6 # 8 # 1 9 % G # E
1 " (% (K 3 (\$ % * / % 1 " (% # , - # 7 # - . & 8 % # 7 * 8 7 (- C

%

] C - & + , - , (, - # &) \$ " + F # & + - / - 4 - , - " + 6 %
%

.\$(%#1\$A(\$1%(//+1\$%1*%H((3%\$1.-,(1\$%&,-%/&6.819%#/,/*+)(-,%&\$%1*%
\$&)(%&,-%&,9%6"&,2(\$%#,"C%?3(6#/#6&889I%1"(%B,\$1#1.1#*,%G#88%H((3%
(&6"%3&+1#6#3&1#,2%\$1.-,(1%&,-%/&6.819%)()A(+%&33+#\$(-%*/%#"#\$%*+
+(\$3*,\$#A#8#1#(\$I%#,68.-#,2%A.1%,*1%8#)#1(-%1*%1"(%/*88*G#,2a%
%

&C!*%/*88*G%1"(%&-)#,\$1+&1#7(%3*8#6#(\$I%\$1&,-&+-,\$%&,-%3+&61#
*/%1"(%;&6#8#19C%
%

AC!*%+(3*+1%1*%1"(%;&6#8#19%*,%1#)(%&,-%1*%/*88*G%&88%(\$1&A&
+(2.8&1#*,\$%*/%1"(%;&6#8#19C%
%

6C!*%H((3%#,%6*,/#-(,6(%&88%)(-#6&8I%"(&81"l%/#,&,6#&8%&,-%\$*6#&
5#,68.-#,2%)(,1&8%"(&81"<%#/,/*+)&1#*,%3(+1&#,#,2%1*%3&+1#6.8&-
)&11(+ \$I%68#,(1\$%*+%3&1#,(1\$C%
%

-C!*%,*1%3.A8#\$"%&,9%)&1(+#&8%+(8&1(-%1*%1"(%ECQCPC%1"&1%#-(,
+%,(\$%1"(%,&)(%/%1"(%B,\$1#1.1#*,l%1"(%=*&+-%*/%>(2,(1\$%*/%1
0,#7(+ \$#19%?9\$1())%*/%@(*+2#&l%1"(%;&6#8#19%*+%#1\$%)()A(+ \$I%
68#,(1\$I%\$1.-,(1\$I%/&6.819%#+(6189%#,-#+(6189%#.,8(\$%\$
3+#+%G+#11,(%3(+)\$#\$#*,%#%#%+(6(#7(-%/+*)%1"(%B,\$1#1.1#*,l%1"
=*&+-%*/%>(2,(1\$%*/%1"(%O,#7(+ \$#19%?9\$1())%*/%@(*+2#&l%&,-%1
;&6#8#19C%O*G(7(+l%1"(%;&6#8#19%"(+ (A9%2+&,1\$%1*%1"(%B,\$1#1
1"(%+#2"1%1*%3.A8#\$"%B,\$1#1.1#*,%1%&1#7(%)&1(+#&8%\$\$.6"%&\$%
6&1&8*2\$I%6*+\$(%\$988&A#I%ECQCPC%+(3*+1\$%(16C%1"&1%#-(,1;
1"(%,&)(%*/%1"(%;&6#8#19%*+%#1\$%)()A(+ \$I%\$1&/l%#-(6189%*+9
#,-#+(6189C%
%

(C!*%6*)389%G#1"%&88%/(-(+&8I%\$1&1(%&,-%8*6&8%8&G\$%+(2&+-#
.\$(l%3*\$\$(\$#\$#,l%)/&61.+(%*+%-#\$1+#A.1#*,%*/%&86**"8%&,-%
6*,1+*88(-%\$.A\$1&,&(\$C%
%

/C!*%/*88*G%T,(1(+ \$%/+%)#\$(&\$(%T*,1+*8%&,-%V+(7,(1#*,%5TC]CTC<
O,#7(+ \$&8%V+(6&.1#*,\$%/+%=8** -A*+,(%V&1"*2,(\$I%TC]CTC%
@.#-(8#,(\$%/+%!A(+6.8*\$#\$%B,/(61#*,%T*,1+*8I%&,-%
^66.3&1#*,&8%?&/,(%&81"%E-)#,\$1+&1#*,%5^C?COCEC<%
>(\$3#+&1*+9%V+*1(61#*,%?1&,-&+-C%
%

2C!*%&++&,2(%/*+%&,-%A(%\$*8(89%+(\$3*,\$#A8(%/*+%8#7#,2%
&66*))*-&1#*,\$%G"#8(%&1%1"(%;&6#8#19C%
%

"C !*%6*,/*+)1%*((\$1&A8#\$("(-%\$1&,-&+-\$%&,-%3+&61#6(\$%G"#8(%
1+&#,#,2%&1%1"(%;86#8#19C%
%

#C !*%3+*7#-(%1"(%,(6(\$\$&+9%&,-%&33+*3+#&1(%.,#/*+) \$%&,-%
\$.338#(\$%+(J.#+(-%G"(%*(%*1%3+*7#-(-%A9%1%&%;&6#8#19C%
%

DC !*%G(&+%&%,&)(%1&2%1"&1%68(&+89%#-(,1#/#(\$%"#)b"(%+&\$%&%\$
*+%/&6.819%)()A%+C%
%

HC !*%\$#2,%&%G+#11(,%&2+(()(,1%*A8#2&1#,2%1"(%\$19%1%*+%/&6.8
)()A(+%1%*A\$(+7(%&88%+.8(\$%&,-%3*8#6#(\$%(\$1&A8#\$("(-%A9%1"
;&6#8#19%1%*)&#,#,1%1"(%6*,/#-(,1#&8#19%*/%3&1#(,1%#,*+)&1#
&,-%1%*+(/+&#,%/*+)%3.A8#"\$#,2%&,9%)&1(+&8%+(8&1(-%1%*1"(%
1"&1%#-(,1#/#(\$%*+%.(\$%*/%1"(%,&)(%*/%1"(%=*&4(%*/%>(2,(1\$1%
B,\$1#1.1#*,%*+%1"(%;&6#8#19%#+(6189%*+%,#,-#+(6189%*+%.(\$
,&)(%*/%1"(%;&6#8#19%G#1"*1.%/#+\$1%*A1&#,#,2%G+#11(,%&33+*7
?.AD(61%1%*1"(%+#2"1%1%*3.A8#\$"%\$(1%/*+1"%#%\$(61#*,%-&A*7

%

XC !"(%B,\$1#1.1#*,%G#88%+(J.#+(&88%\$1.-,(1%3&+(%#6#3&*,1%&1%
(,+*88)(,1%#,%1"(%ECQCPC%J%&,-%&\$%,(6(\$\$&+9%&,-%&33+*3+#&1(%
-.+#,2%1"(%3(+*%-%*/%3&+1#6#3&1#*,1%1%.,-(+2%*%&%"(&81"(%(K&)#,&1#*,
G#88%A(%,(6(\$\$&+9%1%*-1(+)#,(%1"&1%1"(9%&+(%/+((%/+*)%&,9%#,(61
+%6,1&2#*.\$%-#\$((\$(\$1%&A8%)(1%*3(+/*+)1"(%#+%&61#7#1#(\$%#,%1"(%
ECQCPC%3+*2+&)%#,%*+-(+%1%*(,\$+(%1"&1%\$1.-,(1%*-%,*1%3*\$(%&%-#-
1"+(&1%1%*1"(%("&81"%*+,%\$&/(19%*/%*1"(%+I%G"#6"%)&9%#68.-(!=I%V
1(\$1%*+%6"(\$%&%"(3&1#1%6*+(&,1#A*-9%1(\$11%&,-%>.A(88&I%
)(&\$8(\$%&),%3\$%1(\$1\$%*+%-*6.),(1&1#*,%*/%#)).# [&1#*,C%E1%1"(%
31#,%*/%1"(%;&6#8#19%\$.6"%("&81"(%(K&)#,&1#*,%)&9%A(%3(+/*+)(-%,
1"(%;&6#8#19%&1%1"(%\$*8(%(K3,(\$%*/%1"(%\$1.-,(1%3&+1#6#3&,1\$C%E,5
)(-#6&8%*+%"(&81"%6&+(%5())+2,(69%*+%*1"(%G#\$(<%1"&1%&)&9%A(%+(6
A9%&,%B,\$1#1.1#*,%\$1.-,(1%*+%/&6.819%)()A(+&1%1"(%;&6#8#19%#,%1"(
6*+.\$(%*/%1"(%ECQCPC%\$"&88%A(%&1%1"(%\$*8(%(K3,(\$%*/%1"(%#,-#7#-
+(6#3#(,1%*/%\$.6"%6&+(S%3+*7#-(-%1"&1%,*1"#,2%"(+(#,%\$"&88%+(J.#+()
;&6#8#19%1%*3+*7#-(%&,9%\$.6"%6&+(C%6/2%\$19%2&+1#6#3&,1%
G"*-%(\$%,*1%)((1%1"(%("&81"%6+#1(+&#%(\$1&A8#\$("(-%A9%1"(%;&6#8#19
,*1%A(%&\$#2,(-%1%*1"(%;&6#8#19%*+&88*G(-%1%*6*,1#.,(%1%*3&+1#6
1"(%ECQCPC%&1%1"(%;&6#8#19C%!"(%;&6#8#19%&\$%1"(%+#2"1%&1%&,9
+(J.(\$1%("&81"%\$1%+(3*+1\$%*,%\$1.-,(1%&,-%/&6.819%3&+1#6#3&,1\$1%1%*
1"(%(K1,(1%&88*G(-%A9%&338#6&A8(%8&GC%'*+(*7(+I%#/%1"(%\$1.-,(1%&
/&6.819%)()A(+%"&\$%&,%(K3*\$%+(%1%*A8**-%*+%A*-9%\$.A\$1&,6(\$I%#/%1"
#%\$%&,%#D.+9%1%*1"(%\$1.-,(1%&,-b*+%/&6.819%)()A(+&#%+%/#/%1"(%+
#,%#/(61#*.\$%-#\$((\$(%*.1A+(&HI%1"(%B,\$1#1.1#*,%&2+((I%1%*1"(%(K1,(1%

&88*G(-%A9%8&GI%1*%\$(,-%1"(%\$1.-,(1L\$%&,-b*+%/&6.819%)()A(+L\$%"(&8
+(6*+-%\$G#1"#,%1G*%5M<%A.\$#,((\$%-&9\$%*/%1"(%+(6(#31%*/%&%G+#11
+(J.(\$1%A9%1"(%;&6#8#19%/*+%\$.6"%(&81"+(6*+-%\$C%
%

cC !("B,\$1#1.1#*,%\$"&88%"&7(%1"(%/.88%+(\$3*,\$#A#8#19%/*+%1"(%6*,-.61%
\$1.-,(1%*+%/&6.819%-#\$6#38#,&+9%3*+6((-#2\$%&,-%\$"&88%6*,-.61%1"(%
\$&)(%#,%&66*+-%,6(%G#1"%"&88%&338#6&A8(%\$1&1.1(\$I%+.8(\$I%+(2.8&1;
6&\$(%8&G%
%

WC !("B,\$1#1.1#*,%G#88%&\$#2#1#6/*+(3+(\$,(1&1#7(5\$<%&%8#&#*\$,5\$<
A(1G(,%1"(%;&6#8#19%&,-%1"(%B,\$1#1.1#*,C!"(%B,\$1#1.1#*,%/&6.819b\$1\$
+(3+(\$,(1&1#7(5\$<%G#88%A(%-(\$2,&1(-%#,%1%#E2+(()1C%

%

PC ! (, (%4)\$"+F#&+/-4-, -"+6%
%

FC !("3&+1#(\$G#88%G*+H%1*2(1"(%+1*%)&#,%%#%7#&8#19%
8(&+,#2%(K3(+#(6(\$%/*+%1"(%B,\$1#1.1#*,L\$%\$1.-,(15\$<1%G"#8(%&1%1"(%
1#)(%("&6#2%1"(%+(\$*.+6(\$%&7&A8(%1*%1"(%;&6#8#19%/*+%1"(%
3*+7#-#2%*/%6&+(%1*%#1\$%68#(1\$%&,-%3&1#(1\$C%E1%1"(%+(J.(\$1%*/
3&+19I%&)(1#2%*+6*/(+&A%#8-%A(1G(,%B,\$1#1.1#*,%&,-%
;&6#8#19%+(3+(\$,(1&1#7(\$%1*%+(\$*87(%&9%3*+A8())\$%*+%-7(8*3%&9%
#)3*+7)(1\$%#,%1"(%*3(+&1#*,%*/%1%#ECQCPC%
%

MC !"#%G*+H#2%+(8&1#*,\$"#3%&,-%&/#8#&1#*,%\$"&88%A(%+(7#(G(-%&,,&E
A9%1"(%3&+1#(\$C%!"#\$%'()*+&,-)*/%&#&+2#1)&9%A(%&)(,-(-
&1%&9%1#)(%A9%).1.&8%G+#11(,%&2+(()1%*/%1"(%3&+1#(\$C%B1%)&9%
6&6(8(-%&1%&9%1#)(%A9%(#1"(%+3&+19%.3*%,*1%8(\$%1"&,%#,(19%5\
-&9\$%G+#11(,%*1#6(%1*%1"(%*1"(%+3&+19I%A.1%&9%\$1.-,(1\$%6.++(189
&,%ECQCPC%)&9%6*)3&ECQCPC%
%

RC !("B,\$1#1.1#*,%&,-%1"(%;&6#8#19%&6H,*G8(-2(%&,-%&2+((%1"&1%,(#1"(%+9
3&+19%\$"&88%A(%+(\$3*,\$#A8(%/*+%&9%8*\$%\$I%#D.+9%*+*%1"(%+%-&)&2(
3(+*\$,%*+3*+3(+19%*/%&9%\$1.-,(1%*+%/&6.819%)()A(+%3&+1#6#3&1#,
1"(%ECQCPC%.,8(\$%\$.6"%8*%\$%#9%+(\$81\$%/+*)%1"(%
,(28#2(6(%*+G#8/.8%6*,-.61%*/%1"&1%3&+19I%#1\$%&2(1\$I%*//#6(+\$\$
)38*9((\$C%
%

YC !"#%G*+H#2%+(8&1#*,\$"#3%#%\$#1,(-(-%\$*8(89%/*+%1"(%).1.&8%A(,/1%*/%1"(%
3&+1#(\$%"+(1*I%&,-%1"(%+(%#%\$,%*#1(1#*,I%(K3+(\$%\$*+*%1"(%G#\$(I%1*%
6+(&1(%&9%2#1\$%*+%#1(+(\$1\$%/*+%&9%3&+19%*+3(+*\$,%*1"(%+1"&,%

